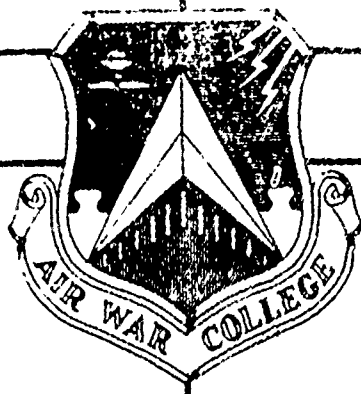


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U.S. AIR FORCE DOCTRINE: A PERSPECTIVE

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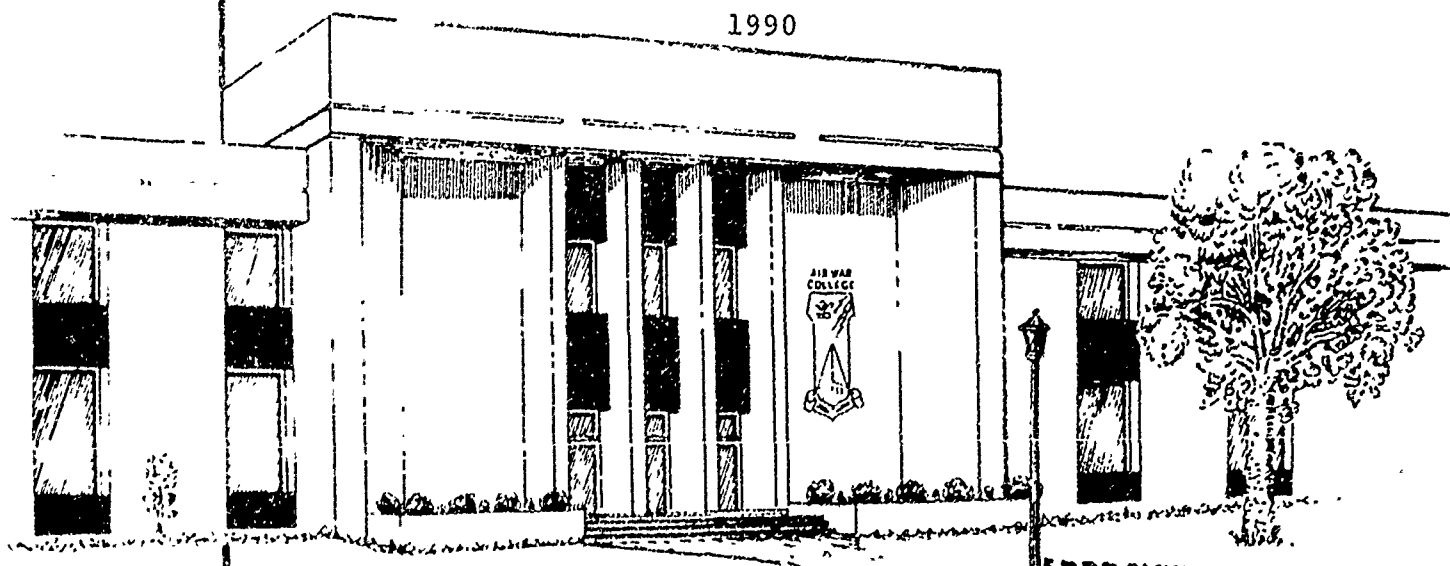
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1990



AIR UNIVERSITY
UNITED STATES AIR FORCE
MAXWELL AIR FORCE BASE, ALABAMA

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U.S. AIR FORCE DOCTRINE: A PERSPECTIVE

by

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A DEFENSE ANALYTICAL STUDY SUBMITTED TO THE FACULTY

IN

FULLFILLMENT OF THE CURRICULUM

REQUIREMENT

Advisor: Colonel James E. Little

MAXWELL AIR FORCE BASE, ALABAMA

May 1990

DISCLAIMER

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EXECUTIVE SUMMARY

TITLE: U.S. Air Force Doctrine: A Perspective AUTHORS: James E. Andrews, Colonel, USAF; Allen B. Bowser, Lieutenant Colonel, USAF; William R. Johnson, Jr., Lieutenant Colonel, USAF; Steven J. Redmann, Lieutenant Colonel, USAF; and Richard H. Zemet, Lieutenant Colonel, USAF.

— ~~A~~ A changing threat, increased competition for scarce funding, and differing perceptions of the role of tomorrow's military may radically change the way the Air Force is structured and employed by the turn of the century. Sound doctrine could be the cornerstone for the Air Force's response to the future.) This effort takes an in-depth look at air power doctrine — some changes are required to ensure we are ready for these challenges.

Chapter I begins by examining definitions of doctrine, tracing its history, analyzing the three sources of doctrine and its purposes, and identifying shortfalls in each category. The next chapter, while reviewing the Air Force's doctrine development process, asserts that air power doctrine has not been developed through a rigorous process. It needs to be.) The author proposes requisite elements and sequence of a rigorous doctrine development process founded on a model to ensure the best doctrine for the future. Chapter III explains where the responsibility for air power doctrine has been, where it is today, and where it should be. Today's responsibility needs to shift from the Air Staff to the Air (over)

University Center for Research, Doctrine, and Education (CADRE) to guarantee the "right" people, in the "right" organization, at the "right" location develop air power doctrine. Next, Chapter IV confirms that the Air Force sustains, trains, and equips along doctrine lines. The assessment shows, however, the Air Force lacking in organizing according to current doctrine. Finally, Chapter V highlights some controversial doctrine areas of combat support, close air support, and space. These subjects require specific attention in the doctrine arena.

Air power doctrine is crucial to the future of the Air Force. Failure of the Air Force to refocus the purposes of doctrine, address the fundamental areas of the doctrine development process, the responsibility of doctrine, and the current doctrinal issues could undermine future success required in a dynamic and rapidly changing environment.

→ Keywords: Military doctrine, Air Force planning, Military forces (United States), Theses. (RWS) ←

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Colonel James E. Andrews received his commission in 1970 upon graduation from the US Air Force Academy. During the past twelve years, Colonel Andrews has served as pilot in the Strategic Air Command, held staff positions at the US Air Force Academy and Allied Forces Northern Europe; commanded an air refueling squadron and recently completed an assignment as Deputy Commander for Operations. He holds a Bachelor's Degree in International Affairs from the US Air Force Academy and a Master's Degree in Human Relations and Supervision from Louisiana Tech University. Colonel Andrews is a graduate of Squadron Officer School, the Armed Forces Staff College, and the Air War College Class of 1990.

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INTRODUCTION

"Basic doctrine evolves through the continuing analysis and testing of military operations in the light of national objectives and the changing military environment . . . It is probable that new interpretations will continue to be needed if Air Force doctrine is to be responsible to changing national policy requirements, the potential military threat, and developments in military technology."

The world as we know it is rapidly changing. The Berlin Wall has come down. The Warsaw Pact is no longer an effective military alliance; and, the Soviet Bear has transformed its world image to that of a cuddly Teddy Bear. These changes give more credence to those arguing that the most horrible war -- a war between the two great superpowers -- is perhaps the least likely that we will fight. Add to the changing threat: a change in the enemy's capability; the success of Intermediate Nuclear Force reduction agreements; the likelihood of conventional force reductions; a surge of nationalism around the globe (including among many of our allies); and further political pressure to reduce military expenditures, then the current way the military finds itself employed and structured may see a radical change by the turn of the century.

The "threat" although changed has not disappeared. The breakout of peace and nationalism throughout the Warsaw Pact has brought a period of uncertainty and instability. At one end of the spectrum of conflict remains, albeit remote, the possibility and capability of our major adversary to initiate a nuclear war. Events in Panama, which resulted from "a flexing of the United State's military muscle" and our declared war on

drugs proves yet again that the United States military is an instrument of national policy that can be used at a different end of the conflict spectrum. In the past, emphasis has been on focusing on military threats - will tomorrow require a yet broader look at all threats to our national interests?

As change continues to take place, we believe military doctrine takes on increased importance. Political leaders, faced with competing demands for domestic spending will press the military to justify the need for its present force structure and arsenal of weapons. The American public may perceive a reduced threat as we continue to battle the budget deficit and restructure our forces. It will be up to the military to articulate not only its *raison d'etre* but convince the American taxpayers that we are spending their tax dollars wisely. Sound doctrine could be the cornerstone for the Services' response to the future. Will Air Force doctrine provide the basis for how best to project airpower in the future? Can it help decide what weapons and forces will be required to meet today's threat and those of tomorrow's? Will quality equipment and quality forces be possible to find given constraints on developing technology and future recruitment and retention of forces?

This effort takes an in-depth look at basic Air Force doctrine. We present an analysis of what doctrine is, how it evolved, why it is important; then we discuss how it has been developed and how it should be developed; look at who has had the responsibility for air power doctrine development and who should bear that responsibility in the future; investigate how the Air Force implements its basic doctrine; and, finally, examine a few of the major issues confronting its currency.

CHAPTER I

BASIC AIR FORCE DOCTRINE

by Lt Col Allen B. Bowser, USAF

Introduction

"Any Air Force which does not keep its doctrine ahead of its equipment, and its vision far into the future, can only delude the nation into a false sense of security." ²

What is doctrine, how did it evolve, and why do we have it? This chapter examines each of these issues in greater detail. We will look at the problems encountered when one attempts simply to define doctrine. Then we trace the evolution of doctrine from the early beginnings to the present time where some suggest that we face a dilemma. We then analyze the three sources of doctrine (historical experience, technology and professional insight) in order to determine if current doctrine presents a proper balance of each. Finally, using AFR 1-2, *Assignment of Responsibilities for Development of Aerospace Doctrine*, we present the five stated purposes of basic aerospace doctrine and allow you to determine if it is serving the purposes stated.

Defining Doctrine

We believe that any discussion of doctrine must begin with a definition of doctrine. It is important to keep that definition in mind for we found that subsequent discussion of the subject can quickly digress

into discussions of strategy and tactics. While researching the issue we found that we weren't alone; not only did such digressions take place in our group preparation for this product, but also in our seminars. Even an Air War College study in 1951 cited the same problem that doctrine was easily confused with strategy, tactics and techniques.³ So then what is doctrine?

The word doctrine has been around since the 14th century. It originally meant "the action of teaching" or "that, which is taught or laid down as true concerning a particular subject or department of knowledge; usually in the realm of religion or politics."⁴

In 1943, an Army Air Force staff officer defined doctrine as "a body of fundamental principles expressing the logical possibilities and objectives of air warfare, as well as its general limitations."⁵ It wasn't until the United States Air Force achieved its own status as a separate Air Force that Air University got the job of developing Air Force doctrine. By 1948, Air University accepted the definition of doctrine provided by the Joint Chiefs of Staff:

A compilation of principles and policies, applicable to a subject, which has been developed through experience or by theory, that represent the best available thought, and indicate and guide, but do not bind in practice. Its purpose is to provide that understanding within a force which generates mutual confidence between the commander and his subordinates in order that timely and effective action will be taken by all concerned in the absence of instructions.⁶

Currently, the Joint Chiefs of Staff defines doctrine as "Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgement in application."⁷ Following continued acceptance of the Joint Chiefs of Staff definition, the United States Air Force used it to

develop and define aerospace doctrine as:

. . . a statement of officially sanctioned beliefs and war fighting principles which describes and guide the proper use of aerospace forces in military action. The Air Force promulgates and teaches this doctrine as a common frame of reference on the best way to prepare and employ aerospace forces. Accordingly, aerospace doctrine guides how the Air Force organizes, trains, equips, and sustains its forces.⁸

The Joint Chiefs of Staff adopted definition becomes a point of departure for controversy from those studying doctrine. Major General I.B. Holley Jr., in particular, writes a great deal on the subject. He sees doctrine as "what is officially approved to be taught - whether in a service school or an operational unit engaged in training - about what methods to use to carry out a military objective." He goes on to say that doctrine is more than just that, it is "the point of departure for virtually every activity in the air arm."⁹

Others attempt to even further simplify the definition by stating that "military doctrine is what we believe about the best way to conduct military affairs. Even more briefly, doctrine is what we believe about the best ways to do things."¹⁰

A second source of controversy is that the definition says very little about war. If we compare definitions of doctrine to that of our primary adversary - the Soviet Union, then the absence of war becomes more obvious. The Soviets define military doctrine as:

A nation's officially accepted system of scientifically founded views on the nature of modern wars and the use of Armed Forces in them and also on the requirement arising from these views regarding the country and its armed forces being made ready for war.¹¹

Soviet military doctrine answers the following five basic questions:

(1) What kind of enemy will the USSR have to deal with in a probable war? (2) What is the character of the war in which the USSR will take part? (3) What will be the USSR's aims and tasks? (4) What forces will be necessary to fulfill the tasks, and what direction will military development follow? (5) What will the means of warfare be?¹²

It appears that another source of the controversy comes from trying to relate doctrine to principles. Principles often denote a checklist mentality and doctrine by its very nature needs to be more fluid. Looking at two diametrically opposed schools of thought, we find those that want to apply either Jomini or Clausewitz thinking to doctrine. The Jominian view emphasizes a precise definition and presents the case for a formalized process or methodology to formulate doctrine.¹³ The necessity for a system or a formal process for developing doctrine is addressed in depth in Chapter Two. On the other hand, the Clausewitzian concept insists that a formal definition of doctrine that captures all particulars can't be given. They see doctrine as a set of shared assumptions and beliefs providing a collective response to war as it unfolds.¹⁴

Perhaps some expect too much by trying to get a precise definition of doctrine? Part of the problem may result from an expectation of doctrine to provide a process that allows for war to be handled in mechanistic terms. Jomini argued that clear definitions must exist to avoid flawed military practice.¹⁵ But his thinking proved wanting when applied to battles such as the U.S. Civil War, where "commanders waited in vain for the ideal battle based on Jominian assumptions."¹⁶

The important point when defining doctrine is not to confuse it with strategy. "Doctrine is however, related to means. If strategy is concerned with what is to be done, doctrine involves how it is to be carried out."¹⁷ In other words, doctrine should influence strategy and the results of strategy provide experience - a source of doctrine.¹⁸ Then one might agree with General Holley that the best definition holds doctrine as "that mode of approach which repeated experience has shown usually

works."¹⁹ Tracing the evolution of Air Force basic doctrine, provides us with a better understanding of the problem we find ourselves facing today.

Evolution of Doctrine

It was for instructional purposes, that in 1921, Brigadier General William Mitchell prepared a draft of what could well be called the Air Force's first doctrinal manual.²⁰ His first book, *Our Air Force, The Keystone of National Defense*, is the first attempt to develop a unique air doctrine separate from that of the Army.²¹ Yet the War Department in its doctrinal manual of the period, *Fundamental Principles for the Employment of the Air Service*, War Department Training Regulation (TR) 440-15, 1926, declared that the purpose of air units was to assist ground forces and the decision of how to employ and control air assets belonged to Army commanders.²²

It wasn't until 1935 that a compromise for those seeking an independent Air Force resulted in the revision of War Department Training Regulation 440-15, *Employment of the Air Force of the Army*, and establishment of a centralized General Headquarters Air Force that same year.²³ During this decade, air power thinkers of the Air Corps Tactical Training School articulated the strategic bombing doctrine. Parts of that doctrine later proved to be flawed because it didn't accept the need of fighter escorts. Yet, the basic doctrine that evolved drove technological requirements. It set the goal for a great bomber fleet and provided the framework within which the Army Air Force adapted to the realities of war.²⁴

In 1940, another revision of TR 440-15 provided a further step toward independence for a separate air arm as the title changed to *Employ-*

ment of the Aviation of the Army. Here, for perhaps the first time, the Army acknowledged the importance of strategic bombing.²⁵

The title of a new Army field manual, published in 1942, *Aviation in Support of Ground Forces*, Army Field Manual 31-35,²⁶ reflected a return to the importance of ground support. Later that year, the war in North Africa allowed for the Air Force's doctrinal separation from the Army. As a result, the War Department in July 1943, published FM 100-20, *Command and Employment of Air Power*.²⁷ This document provided the independence long desired by proponents of a separate air force. It recognized the role of air superiority as a requirement for the success of land operations and recognized the need for central control and employment by an air commander.²⁸ This theme of an indivisible air arm became a common thread for all future editions of aerospace doctrine.

When the Air Force became independent from the Army in 1947, Air University got the job of developing the Air Force's doctrine. It was a group from the Air War College evaluation staff, led by Colonel William W. Momyer, who produced a proposed Air Force manual. They forwarded it to Washington on 14 July 1951 seeking the approval of the Air Force Council.²⁹ It was the Council's desire to expeditiously produce and disseminate the new Air Force doctrine, but the Air Staff moved very slowly.³⁰ On 25 October 1951, the Air Staff returned the Air University's draft of the basic Air Force manual without approval.³¹ After many rewrites, Air Force Manual 1-2, *United States Air Force Basic Doctrine*, a seventeen page pocket size edition, received approval on 1 April 1953.³²

The Vice Chief of Staff, USAF, sent AFM 1-2 out to each major air commander for comment. Only the Commander, Far East Air Forces recommended

substantial changes — he wanted an elaboration of the principles of war as they pertained to the employment of air forces.³³ Though his comments didn't appear sufficient to require a revision, a new nineteen page pocket size edition of AFM 1-2 was published on 1 April 1954.

A change of personnel and thinking at the Air War College Evaluation Staff in July 1954; combined with the Air University Commander's (Lieutenant General Laurence S. Kuter) concerns that Air Force doctrine did not sufficiently stress the capabilities of air power in the entire spectrum of international conflict, brought yet another revision. The 1 April 1955, AFM 1-2 represented a codification of experience from World War II and the Korean war bearing on the subject of air power and air warfare. Additionally, a clear discussion of the area between the two extremes of conflict (general war and full peace) added value to the manual.³⁴ It was an unclassified, ten page document that received praise for its clear discussion of the role of airpower across the spectrum of international conflict and clearly established the worth of air forces without "denigrating" the other services.³⁵ However, other Services did not necessarily share those sentiments and the 1955 edition of AFM 1-2 fell victim to inter-Service disagreements on doctrine and technology.³⁶ Army doctrine saw land forces as the decisive military component. Similarly, both the Army and Navy favored decentralized airpower. Whereas this new doctrine required that "all command arrangements must be in accord with the precept that neither air forces nor their field of activity can be segmented and portioned among different interests."³⁷

Space, the development of new weapons, the Defense reorganization act of 1958, and the transfer of doctrine responsibility within the Air

Force were the next events to influence Air Force doctrine. On 25 April 1958, the Air Policy Branch, proposed a revision of AFM 1-2 to incorporate new thinking on "aerospace".³⁸ Later in 1958, within the Air Staff, the Air Doctrine Branch, located under the Aerospace Policy Division of the Plans Directorate, Headquarters USAF, was designated as the single point of reference for the review of basic air doctrine prepared at the Air University and for operational doctrine prepared in the major air commands.³⁹ Following an Air Force Directorate of Plans recommendation, Air University lost responsibility for air doctrine and the Air Doctrine branch inherited the job.

The revision of AFM 1-2, issued on 1 December 1959, resulted in a thirteen page manual that consisted primarily of changes in terminology than substance. The manual stated:

The aerospace is an operationally indivisible medium consisting of the total expanse beyond the earth's surface. The forces of the Air Force comprise a family of operating systems - air systems, ballistic missiles, and space vehicle systems. These are the fundamental aerospace forces of the nations.⁴⁰

Several false starts in trying to revise Air Force doctrine took place after 1959.⁴¹ It also appears that confusion existed on just how to keep doctrine current because an additional vehicle for relaying doctrine appeared in 1961. Air Force positions, developed on a variety of subjects by the Aerospace Policy Division, and published by the Secretary of Air Force Office of Information appeared in the *Air Force Information Policy Letter for Commanders* and the *monthly Supplement to the Information Policy Letter for Commanders*.⁴²

The Secretary of the Air Force in 1961, Eugene M. Zuckert, believed that some Air Force leaders were approaching current problems with decade

old methods.⁴³ Additionally, as late as 1962, the United States Air Force Chief of Staff, General Curtis E. LeMay, voiced his concern that American airpower doctrine hadn't changed since 1935.⁴⁴ These concerns resulted in the establishment of Project Forecast in 1963 and the preparation of an entirely new doctrinal manual designed to support national policy and strategy and simultaneously look forward.⁴⁵ Project Forecast provided a comprehensive study and analysis of the Air Force structure projected into the 1965-1975 period. A draft of this manual, completed in the winter of 1963-1964, was published on 14 August 1964, as AFM 1-1, *United States Air Force Basic Doctrine*. With the publication of this nineteen page document, "the Air Force had adapted its doctrine to the concept of national security that had emerged from the new strategic situation in which thermonuclear weapons and an assured delivery capability in the hands of potential enemies had altered the use of total military power."⁴⁶ Thus, while focusing on the concept of deterrence, it introduced the policy of flexible response.⁴⁷ The 1964 manual suggested that nuclear strength could deter lower level conflicts. Yet the Air Force needed to be prepared to fight either a general nuclear, a tactical nuclear, a conventional, or a counter-insurgency war.⁴⁸ It also was the first Air Force manual of basic doctrine to omit any reference to the Principles of War.⁴⁹

The next revision took seven years to produce. The 1971 manual reflected lessons from the Middle East War of 1967, the Soviet invasion of Czechoslovakia and Air Force involvement in Vietnam.⁵⁰ This revision showed how those lessons disproved the 1964 suggestion that nuclear strength could deter lower levels of conflict and recognized the need to deter with general purpose forces. It also replaced the general and

limited categories of war with conventional, high intensity and low intensity war. Additionally, an entire chapter devoted to another category of war - special operations appeared. "It was also the first edition to include subelement tasks of airpower: search and rescue, electronic warfare, air refueling, airborne command and control, psychological operations, and supporting functions, such as logistics, communications, intelligence, weather service and installation security."⁵¹ Although previous editions discussed aerospace forces this revision listed a series of operational responsibilities in space.⁵²

Four years later, the 1975 twelve page edition of AFM 1-1 emphasized the philosophy of "sufficiency". It also introduced the Department of Defense Total Force Policy and reintroduced the Principles of War. Eight operational missions replaced the operational tasks of airpower.

The 14 February 1979, AFM 1-1 again emphasized the need to sustain deterrence. The levels of conflict took on new definitions: localized war, theater conventional war, theater nuclear war, and strategic nuclear war.⁵³ Basic operational missions increased by one - space operations, and a collateral function appeared - support of naval operations. This seventy-five page "comic-book" style document, complete with quotations from prominent individuals of questionable doctrinal competence, detracted from the professional nature of the subject and resulted in criticism from those who study doctrine.⁵⁴ Others cite that this edition "said virtually nothing about the employment of airpower and even managed to do violence to the venerable principles of war."⁵⁵ Still others criticize the manual for losing sight of its goal and doing nothing more than "telling the Air Force story."⁵⁶

The current, 16 March 1984, AFM 1-1 has four short chapters consisting of forty-three pages and is the primary subject of this effort. The manual begins by emphasizing both the relationship of the military to the nation and the inter-relationship among the services.⁵⁷ It goes on to examine the specific employment of aerospace forces with an in-depth examination of missions and specialized tasks. The manual covers each mission in terms of how it contributes to the achievement of the air component commander's objective. It returns to the theme of interrelationships by discussing the employment of aerospace forces as part of a unified military organization to win in war. Aerospace maritime operations replace space operations as an Air Force mission. The final chapter addresses the organization, training, equipping and sustainment of aerospace forces. Defense of the United States, deterrence and war in support of national policies remain the cornerstone objectives of the Air Force. A general reference to a wide spectrum of warfare "from low intensity combat to strategic warfare for national survival" replaces the levels of conflict.

Currently, there are two separate revisions of AFM 1-1 in the field for review and coordination. The United States Air Force Directorate of Operations sent out for coordination a draft manual in March 1989. The Air Power Research Institute at Air University also received direction from the Air Force Chief of Staff to research, write and produce an updated doctrine.⁵⁸ Part one of their 3 October 1989, draft is expected to be signed out at any time.

Sources of Doctrine

Now that we have an idea of what doctrine is and how it evolved lets look at the sources from which we get doctrine. Headquarters United States Air Force Directorate of Operations declares that there exists three sources of doctrine: (1) Historical experience, (2) technology, and (3) professional insight.⁵⁹

Experience

Experience is often quoted as the principal source of doctrine because doctrine is somewhat "a compilation of those things that have generally been successful in the past."⁶⁰ Unfortunately, for airmen there exists only limited experience of airpower as it applies in war. World War I forced the rapid development of combat aircraft and produced future airpower pioneers but produced little upon which to base doctrine.⁶¹ Combat experience grew from World War II onward and included a variety of experience across different parts of the spectrum of conflict - causing the evolution of the number of doctrinal manuals that we've depicted. Experience from training, exercises and evaluations of unit performance produced another valuable source of lessons learned and many found their way into doctrine as it developed.

Yet the question remains that if experience is crucial to the development of doctrine have we properly applied it? Colonel Dennis Drew of the Air University Center for Aerospace Doctrine, Research and Education perceptively points out that:

our doctrine since the days of the Air Corps Tactical School at Maxwell . . . has emphasized two assumptions: wars are fought to destroy the enemy's ability and will to win via intensive attacks on the enemy's

homeland; and the enemies of the United States will be modern industrial nations. Yet, since 1945 we have found ourselves fighting much different kinds of conflict - limited wars in the third world.⁶²

This brings us to two interesting points concerning the "current" 1984 edition of AFM 1-1. First, have we indeed learned from history and applied its lessons to our doctrine? For example: "Episodes like Eighth Air Force's costly failure in October 1943 to penetrate German Air defenses unescorted demonstrate, flawed doctrine can cost lives."⁶³ Yet if we look at page 2-6 of AFM 1-1, under offensive, we see that even though "defending forces" are assumed to be surface forces, we still believe "aerospace forces have the power to penetrate to the heart of an enemy's strength without first defeating defending forces in detail."⁶⁴ Similarly, where are the lessons learned from Vietnam, Grenada, the Falklands, or Libya?

Technology

The second source of doctrine, technology, provides another area worth examining. Historical examples abound where military technology outstripped existing doctrine. In 1957, technology outpaced doctrine. A group of officers in Headquarters Air Research and Development Command concluded that the science of warfare lacked development. They found weapon systems conceived, developed and produced "without consideration of the manner in which they might or might not affect the enemy and without regard to the nature of the military influence they were expected to wage."⁶⁵ Later in 1961, Air Force Secretary Zuckert observed that " . . . adjusting to new hardware still seems to be easier than adjusting to new ideas and new methods?"⁶⁶ He went on to suggest that "New hardware was welcomed with more enthusiasm than were new ideas in the realms of strategy, concepts and doctrine"⁶⁷

Even today, critics suggest that we have the cart before the horse in the case of the B-2. James W. Canan, writing in *Global Powers* makes the point when he stated:

USAF trusts that it will be better able to justify its need for the controversial, costly B-2 by weaving into its updated airpower doctrine all the things that the bomber can do, thus making its prowess indispensable to that doctrine. However, the revolutionary capabilities offered by the B-2 have made it possible - indeed, necessary - to update the doctrine in the first place.⁶⁶

Perhaps a lesson or two could be gleaned by looking back at experiences of Nazi Germany during the World War II when it didn't match technology with appropriate doctrine.

Because technology tended to outstrip doctrine, the German research and development process was critically fragmented and isolated from the operational and planning world. What good technology did exist - such as the first operational jet fighter the Me 262 was often badly managed and operationally wasted.⁶⁷

One has to wonder if lessons such as this contributed to Air Force Systems Command removing itself from the advocate position of developing weapon systems and requiring the using command to take on the task?

What about the Advanced Tactical Fighter, the C-17, and a variety of smart weapons? Will our doctrine drive these requirements or will they drive the need to update doctrine? Is the threat changing? If so, is the interplay between technology and doctrine responsive enough to reflect realistic requirements? Dr. Richard Hallion says it best:

If doctrine lags behind technology, projects that are wildly fanciful may result, projects that are unrelated to the realistic needs and requirements of the service. If technology lags behind doctrine, planners and decision makers will likewise discover that their actual capabilities cannot meet their needs and expectations.⁷⁰

Professional Insight

That brings us to the third source of doctrine - professional insight. Where does it come from and how do we institutional it? We saw that back in 1961, the *Air Force Information Policy Letters for Commanders* tried to serve the function of keeping doctrine current by relaying current policy and positions on a variety of subjects to the field. This procedure opens the possibility that professional insight is limited to that of policy makers. What could follow are contradictory interpretations and confusion. Major General Dale O. Smith, another student of doctrine, cautioned that: "The idea of letting our doctrine drift from the whim of one operational leader to another, or from one ad hoc measure to the next will never provide us with a comprehensive, dynamic, understandable, and salable doctrine necessary to save the Air Force."⁷¹ So where can we capture this professional insight and simultaneously evaluate divergent opinions to keep doctrine dynamic without fear of crossing policy lines?

If we accept the premise that the development of doctrine must begin with an in-depth understanding of war; then military history provides a foundation for the professional insight required to develop doctrine. General Holley reminds us that following World War I "the Army Air Service courted just one fashionable viewpoint despite the expression of diverging opinions. The combat experience (*professional insight*) of qualified fliers was not assiduously sought."⁷² Ignoring the combat experiences of a war, first to use airpower (to any great extent), provided an interesting start to our doctrinal development. It should not surprise us that failure to apply valuable professional insight delayed the emergence of a coherent doctrine.

Later, we found a home for the development of doctrine in what is now Air University. From the days of the Air Corps Tactical School, our best ideas and professional insight about employing airpower surfaced and gathered at Air University through lectures, research projects and seminars. Allegedly, the "best and the brightest" of the Air Force gathered here. Away from positions subordinate to policy makers they contributed solutions to problems of Air Force interest and also formulate basic doctrine.⁷³

If Air Force doctrine is to: represent the judgement of our senior leadership, reflect national policies and technological advances and show compatibility with other armed services, it seems appropriate that its development start at Air University.⁷⁴ Air University offers superb research facilities, access to both historical records and senior policy makers, divergent opinions and some of the best Air Force minds available.

Purpose Of Doctrine

We've looked at the definition, evolution and sources of doctrine. Perhaps the real answer to the question about whether or not we have a dilemma with our doctrine is to examine if it achieves its stated purpose. Although AFM 1-1 accepts the Joint Chiefs of Staff definition and goes on to define aerospace doctrine, one must turn to AFR 1-2 to find the purpose of aerospace doctrine:

U. S. Air Force doctrine: (1) Describes aerospace missions and tasks; (2) Guides combat commanders; (3) Guides weapons development programs and force planning; (4) Guides relationships with other services and; (5) Provides a point of departure for every activity of the Air Force.⁷⁵

With changes taking place in Europe, along with the perceived re-

duction in the Soviet threat, it is no wonder people such as Senator Sam Nunn and his colleagues ask the Air Force to provide the doctrinal justification for current acquisition of major weapon systems. One then must ask if our current doctrine achieves the purposes as stated when defining aerospace doctrine? Does basic aerospace doctrine provide our airmen with definitive guidance on the United States Air Force's missions and employment concepts? Does it outline unique applications of military power? Does AFM 1-1 give us the framework that will be used to maximize the effectiveness of aerospace forces?

Let's examine each of these stated purposes beginning with missions and tasks.

Missions And Tasks

Throughout the development of our basic doctrine the subject of missions and tasks, better known as roles and missions, provides ammunition for opposing views. The limited experience of World War I provided for the air power pioneers a vision of a separate service. Once that became a reality roles and mission battles increased as competition for funds became scarce. As early as 1947, the Secretary of Defense indirectly encouraged inter-service battles by giving the mission to "whoever can do the job better and cheaper"76

A growing Air Force inventory brought with it dedicated advocates, ready and articulate to defend or promote their functional aircraft at the expense of others. As a result, individuals found themselves aligned to a command; and, there developed vested interests and allegiances that fueled the intensity of the roles and missions battles. In June 1952, the

Commander of Air University, Lieutenant General Idwal H. Edwards, almost prevented basic doctrine from getting involved in such controversies. He insisted that "current decisions on matters of organization and roles and missions . . . are not basic doctrine."⁷ His preference of relating the role of the Air Force to national objectives and policies proved successful with the publication of the 1 April 1953, AFM 1-2. Unfortunately, the manual didn't identify (a Pentagon decision) those objectives and policies. Although subsequent revisions retained the theme, roles and missions started appearing with the publication of the 14 August 1964, edition.

In August 1964, five clear missions appeared: counterair, close air support, interdiction, aerial reconnaissance and airlift. Added to the chapter discussing missions but not itself identified as one - command and control.

The same five missions appeared in 1971, but air reconnaissance was subdivided into tactical air reconnaissance and strategic air reconnaissance. Similarly, airlift was subdivided into tactical and strategic. Command and control disappeared but reappeared with a different title of airborne command and control as one of six sub-elements.

In 1975, the missions grew by three: strategic attack, aerospace defense of the United States, and special operations. Air reconnaissance took on a new name - "aerospace surveillance and reconnaissance".

Space appeared as a mission in 1979, but disappeared in 1984. Strategic attack changed into two missions: strategic aerospace offense and aerospace defense of the United States. Maritime operations became a "collateral mission".

This area of roles and missions allows for the greatest source of

continual disagreements, especially from the major commands and more increasingly from the joint arena. A most significant controversy comes when trying to define the role and mission of space. So significant, we address the subject as a major issue affecting doctrine in Chapter Five. Briefly, the foundation for the issue originates by a belief that "real space doctrine remains unrecognized, undocumented, and unaccepted"; though, "it has been practiced, proven, and implemented at mission and operational levels of space organization for over twenty-five years."⁷⁹

Other significant arguments arise over a belief that "power projection" should take its place among the list of missions. The historical experience includes the 1961 Berlin crisis, the B-52's role in the Cuban Crisis and the Middle East airlift of 1973. One only has to look at more recent experiences, such as the attack on Libya, where our allies opposed some of our policies in the Third World. The future bears the possibility of other policies where either our actions are not approved of nor our presence any longer welcome. Accordingly, we may be forbidden to use bases on foreign soil and may be denied over-flight rights to carry out military action."⁸⁰ Even the chief of the Air Force doctrine branch, Colonel Warden accepts that power projection is gaining in importance: "Indeed, range is now, more than ever, the name of the game. As we think about what our doctrine and our operational principles should be, one thing that we're emphasizing more and more is the fact that we have simply got to have range, range, range."⁸⁰ His argument is strengthened as one looks to the current conventional force reduction negotiations that will significantly reduce the size of our forces in Europe. Further support for his argument exists as we ponder the fate of our installations in the Philip-

pires. What about the size of our force in Korea? Thus, shouldn't we consider power projection a key mission or operating principle of future doctrine?

Not only must our doctrine function in the present, it must "be appropriate for the near future, possess flexibility and adaptability to meet changing conditions . . ."⁸¹ Limited wars and a low-intensity war environment will most likely prove commonplace for the next decade.⁸² In fact, the Joint Chiefs of Staff concluded that "detering or waging low-intensity conflict in those parts (Third World) of the world will be the most demanding job for U.S. military forces in the foreseeable future."⁸³

Beyond the near future is the question of space. Will it take on an increased importance? Our doctrine must be cohesive and tie together all the missions of strategic and defensive warfare (to include strategic defense initiative operations), power projection and airlift, special operations, and space.

Guiding Combat Commanders

The second stated purpose of aerospace doctrine is to guide combat commanders. Obviously, the word combat denotes war. Thus, development of doctrine should begin with a thorough understanding of the art of war.⁸⁴ Past versions of doctrine received criticism simply for the absence of words like war, combat, battle and the offensive.⁸⁵ Common themes recur from revision to revision that focus of defining Air Force missions, describing Air power's special characteristics, and the need for an independent Air Force. It is an understanding of war that unifies these themes.⁸⁶ Although the latest version of AFM 1-1 added combat related

words there remains some definite shortfalls when it comes to providing commanders combat guidance.

First, AFM 1-1 fails to adequately address the conduct of war across the spectrum of conflict. The document fails to address the Vietnam war; shows little interest in low-intensity conflict; views special operations primarily in terms of conventional warfare; and, makes clear a void exists in the counterinsurgency arena.⁸⁷

Secondly, it gives overwhelming emphasis to the offense.⁸⁸ Commenting on the latest draft of AFM 1-1, Headquarters Air Force Programs and Resources Directorate highlights the problem:

Historically, the USAF has only rarely had to fight from a position of qualitative or quantitative inferiority to an aerial opponent. This, coupled with our geographic location has certainly, and quite properly, colored our doctrinal perception. Yet, we should still be doctrinally prepared to fight defensively, when necessary, at least until such time as regaining the initiative offensively makes sense.⁸⁹

Thirdly, there is a lack of understanding on how to relate our doctrine to the principles of war. The original draft of our first doctrinal manual did not include a list or discussion of the principles of war. A committee in Washington inserted a section with eight principles titled "Air Forces and the Principles of War."⁹⁰ The principles of war, originally published in 1903 by Marshal Ferdinand Foch, concerned strategy and tactics or the use of weapons.⁹¹ Future editions of AFM 1-1 could not only agree on the number of principles but frequently changed the definitions. In the April 1955, and December 1959, editions, the principles of war took on a new name - "principles for employment of aerospace forces." Both principles disappeared in the August 1964 edition and then seven principles of war along with three principles for employing aerospace forces emerged in the 1975 edition. Could trying to include principles of

war in AFM 1-1 be the source of confusion that Colonel Thomas A. Fabyanic finds when he stated that "another unfortunate aspect of AFM 1-1 is its continuation of the artificial, illogical, and confusing distinctions between strategic and tactical operations"?⁹² Another source of criticism comes from the Army-Air Force Center for Low Intensity Conflict as they comment on the current Air Staff draft. They suggest that any discussion of principles should be "synchronized with JCS Pub 3-0."⁹³ Unfortunately, that publication has not yet been written. Yet others, particularly Army officers, see principles as the cornerstone of doctrine.⁹⁴ The Air Land Battle is the Army's basic doctrine and uses principles in relation to strategy, tactics and operations. Thus, are we trying to provide too much guidance, in the form of tactics and strategy, to our combat commanders? Are we struggling to find a place for principles of war in our doctrine just because those principles form the foundation of Army doctrine?

Finally, if we intend to guide combat commanders should we not include a discussion of the Law of Armed Conflict? The Air Force Staff Judge Advocate believes that such an addition would "remove any question in the minds of those reading this doctrine concerning the extent to which the law of armed conflict will be observed."⁹⁵

Studying war lays the foundation needed to guide combat commanders. Applying lessons learned across a clearly defined spectrum of conflict; and, recognizing employment concepts and limitations imposed by concepts such as principles of war and law of armed conflict may not be enough. Doctrine is important for both planning and performance. It must also be based on a sound appraisal of the operational problems that will face United States forces in a future war.⁹⁶ So then, should this be a purpose

of basic doctrine or should it be a function of professional military education? Do we expect too much by asking basic doctrine to guide combat commanders?

Guide Weapons Development

The third stated role of doctrine is to guide weapons development and force planning. As we develop guidance for our combat commanders for future wars we make certain assumptions about the environment in which our military forces will operate. Based on those same assumptions doctrine also guides the weapons acquisition process, organization and operations.⁹⁷ A major attempt to do this came with Project Forecast that identified ten national policy objectives. Future weapons systems and force structure were to be developed to support these objectives. "One Forecast panel identified more than 40 different future aircraft systems that could be developed."⁹⁸ Included in the list: requirements for the CX-Heavy Logistics Support aircraft, the Short-range attack missile, an anti-intercontinental ballistic missile capability, and a vertical take-off and landing aircraft. Obviously, cost of weapons and political factors often overrule or modify force structure and weapon system procurement recommendations.⁹⁹

Air Force Systems Command recently completed Project Forecast II. The challenge remains the same: the Air Force by its very nature will remain wedded to technology, and the danger is for technology to make our doctrine obsolete.¹⁰⁰ Now more than ever, as large cuts in funding, and ultimately people and equipment, loom on the horizon our doctrine must be sound. It must lay the foundation for the Air Force so it can build and articulate the specific requirements needed to defeat threats across the spectrum of conflict.

Guide Relationships With Other Services

A fourth stated purpose of doctrine is to guide relationships with the other services. "The notion of jointness represents the historical truth that neither air power nor land power nor sea power wins wars by itself."¹⁰¹ As already mentioned, there are some who believe joint doctrine should come first. The question remains about how doctrine achieves this stated purpose. Without reference to the Army's Air Land Battle and the Navy's maritime strategy, how successful can AFM 1-1 be in guiding those desired relationships?

Point Of Departure For All Air Force Activity

Finally, the catch all purpose - that basic doctrine provides a point of departure for every activity of the Air Force. Quite a task for a doctrine that is the subject of so much controversy. Evaluation of just two areas, arms control and the war on drugs, may provide the answer to how successful we are in achieving this objective.

First, arms control. While negotiators are bargaining away weapons and force structure, it is imperative that doctrine be the binding force that not only justifies our future technological research and development, rationalizes our acquisition strategy, governs our employment of forces; but, it also must provide for the arms control process.

Then there is the war on drugs. Should we assume that Air Force doctrine guides actions to fight this war from the drawing board to actual employment? Where does this "war" fit on the spectrum of conflict?

Conclusion

Some say we have a dilemma at various stages from development to application of our doctrine. Are we experiencing a repeat of the problem experienced by General William W. Momyer when putting together the first edition of AFM 1-1? In the early 1950's he wrote: "We find ourselves constantly in a dilemma as to whether we have become so terse the meaning (of doctrine) is clouded and darkness descends upon the reader."¹⁰² "Has our doctrinal quest become entangled in abstract questions of definition that lead nowhere, while the practical problems of actual war fighting are neglected."¹⁰³

Do we expect too much by asking basic doctrine to define roles and missions, weapons acquisition, relationships with other services; and, then serve as a point of departure for everything else that the Air Force does?

Once established doctrine, like roles and missions, develops its own supporters, adversaries and institutional constituencies. It then tends to take on a life of its own. Doctrine can be a servant or a master. We can use it to study the past, plan for the present and guide us into the future. We can allow it to be innovative or we can allow it to stagnate. We can ignore the tough issues and let it be incomplete. When incomplete we can cause it to raise more questions than it will answer. It can guide or it can prescribe. We can fill it with so much material that it fails to obtain its purpose. We can develop it from senior officers down; or, we allow all levels to participate in its development. The decisions are ours.

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CHAPTER II

AIR FORCE DOCTRINE DEVELOPMENT: PROCESS OR SERENDIPITY?

by Lt Col William R. Johnson, Jr., USAF

Introduction

"Doctrine is an institutional choice between competitive ideas." ¹

The above quote by Major Paul H. Herbert, USA is from his 1988 book chronicling the United States Army's far reaching mid 1970's reassessment and revision of basic doctrine led by General William E. DePuy. His assertion goes to the very heart of our thesis: that in spite of over 40 years of institutional longevity and succeeding versions of basic doctrine beginning in April 1953, the United States Air Force does not have a coherent doctrine development process with which to make institutional choices. Is our institution's basic doctrine developed in a reasonably logical manner or process or do we inherit our doctrine through historical serendipity?

This chapter attempts to illustrate the need for an effective doctrine development process (hereafter shortened to "doctrine process"). We will provide insight into our current Air Force doctrinal conundrum and how we arrived by examining our doctrinal heritage. Next, we will analyze and assess models of doctrine development used by the United States Army and Navy, and our chief adversary the Union of Soviet Socialist Republics (USSR). Following this, we will synthesize a set of principles for a

doctrine process and then finish with a notional Air Force doctrinal development model.

Air Force Doctrine Development Conundrum

"Manpower and equipment alone do not produce an effective military establishment any more than a well stocked operating room and a man provide good surgery." ²

The Problem

Just as a good surgical tool and a person "do not effective surgery make," nor, would we assert, do historical experiences (war stories), cosmic technology, and visionary, dedicated, and loyal airmen, good doctrine make! General Charles A. Gabriel, Chief of Staff, US Air Force in his foreword to the March 1984 AFM 1-1 states, "Basic aerospace doctrine has evolved." The Annex A of the same document, which presents the evolution of basic doctrine, states that, "this manual represents the latest iteration of a gradual process of development that began after World War I."³ From this authoritative source, we would like to focus on the two operative words regarding doctrine—"evolves" and "process." Radical doctrine changes are in fact rare, with typical doctrine changes occurring in a gradual or evolutionary manner.⁴ Therefore, if doctrine generally evolves by a gradual process of development, one should expect that within the Air Force, there would be a recognizable formal process by which we logically develop and promulgate Air Force war fighting doctrine.⁵

The Random House dictionary defines a process as "A systematic series of actions directed to some end; specific continuous action or series of changes."⁶ The operative words are "systematic", and "specific continuous action". However neither within AFM 1-1 nor within AFR 1-2, which assigns responsibilities for the development of aerospace doctrine, is there the vaguest reference to a process, the "how", to develop Air Force doctrine.⁷ AFR 1-2 lists responsibilities and administrative procedures, but it provides no doctrine development methodology. In fact there is no Air Force regulation manual or pamphlet which describes or explains how the Air Force formulates doctrine.⁸ A review of 11 versions

of AFM 1-1 from the initial issue of 1 April 1953 through March 1984, reveals minor evolutionary changes but little or no explanation of the doctrinal changes, the reasons for change, the process of change, nor the rigorous support for a change.

General Holley frequently addresses the need for a doctrine process in articles dealing with Air Force doctrine. His classic study of why the doctrine of cavalry charges persisted, in the face of disastrous casualties, and the flawed early air power doctrine developed by a "small band of zealots and true believers" struggling for independence, illustrates vividly the results of not having an institutional doctrinal process.⁹ He further suggests that maybe we should not be surprised because institutionally "military organizations are not ideal instruments for use in the search for truth."¹⁰ He, along with a few others, argue increasingly that we should be as concerned for the process by which doctrine is derived as for the doctrine itself, and that we need a "rational scientific approach," and "some means to study and analyze air power successes and failures."¹¹

The concern for a doctrinal process is as contemporary as recent articles in the Air Force Magazine. "A new doctrine is taking shape" barks out in the headlines of the October 1989 issue which discusses the global power projection capabilities of the new B-2 bomber.¹² The article proudly proclaims, "Air Force is moving to endorse indivisible air power as official writ;" "is updating the doctrine...for employing air power;" "the revolutionary capabilities offered by the B-2 have made it possible--in deed necessary--to update the doctrine;" "Air Force puts B-2 in a class by itself and has given it superstar status billing in the streamlining of air

power doctrine;" and finally the bottom line, "USAF trusts that it will be better able to justify its need for the controversial, costly B-2..."¹³ The B-2 is another, albeit a more sophisticated strategic bomber, and we have had a strategic bombing doctrine since the 1930's. Why therefore are we "updating", "streamlining" doctrine? Since there is we believe, no doctrine process, could this be another adhoc exercise led by a "band of strategic air power zealots?" If the Air Force developed doctrine in an orderly, rational and rigorous manner, would it have been possible that (1) the budget-busting B-2 may not have been doctrinally or operationally necessary, and (2) the acquisition justification-based doctrine may not prove to be operationally sound. Yet another indicator of the search for doctrine is found by surveying professional Air Force and defense journals within the last five years. A review will reveal an increase in the number of "doctrinal" articles, and doctrine debates. This is a healthy sign, but is it productive in the sense of contributing to a professional air power doctrine dialectic within the framework of a formal process, the product being effective Air Force war fighting doctrine?

Why Do We Need a Doctrine Process Now?

On 18 October 1989, a senior Air Force leader responded to a question from the Air War College class of 1990 regarding the state of Air Force doctrine by asserting that "we don't have a doctrine problem."¹⁴ We would argue that there is evidence to the contrary and that the transfer of the task to write basic doctrine from the Headquarters US Air Force's Directorate of Plans to the Air University's Center for Aerospace Doctrine and Research (CADRE) is a quiet acknowledgment that serious institutional doctrine evaluation and development is needed.¹⁵ We would further argue

that we need a formalized doctrine development process now because of two reasons. First, historical and contemporary events are converging professional opinion regarding the value of Air Force doctrine, and second the we need a means to manage the inevitable challenges to Air Force doctrine due to such forces as budget and weapons cost reduction, changing threats, military reform, and jointness.¹⁶

Traditionally, the Air Force has behaved more as a doctrine preserver or protector than a doctrine innovator. Lt. Col. Barry Watts and Major James Hale asserted that, "since 1947, the keepers of U.S. air power doctrine have viewed their inheritance as holy writ more in need of protection than of evolution or change."¹⁷ There has been a persistent loyalty to established doctrine, with constituencies which openly oppose innovation and reform. Moreover, as traditional doctrinal thoughts and action persist, they become more comfortable, difficult to abandon and eventually become articles of faith, or dogma.¹⁸ Therefore, since we have not regularly subjected our doctrinal conventions to re-evaluation, we have become "doctrinal prisoners" of our own history, and consequently doctrinal innovation has become a "neglected" area of military planning and organization."¹⁹

However, the glare of historical analysis and growing professional doctrine debates are calling the doctrinal scriptures into question. The research of many professional Air Force officers, defense analysts, and even congressional staff experts attacks the very basis of Air Force doctrine alleging that long held beliefs regarding air power doctrine from World War II to Vietnam are ill founded. For instance, doctrine experts assert that the decisiveness of strategic bombing is arguable, at best, and

at worst characterized as bankrupt and a failure in Korea and Vietnam.²⁰ These analyses have helped fuel recent military reformers and even focused them on looking specifically at the American approach to war—our doctrine.²¹ Moreover, Air Force doctrine experts assert openly that doctrine published since 1965 reveals an institution that is so "unsure" of its doctrine that, "there is some doubt that we can adequately articulate and defend the basic tenets of air power."²² Therefore, some would argue that for the Air Force to participate in the development of joint doctrine would be premature and unproductive because we don't understand our own service perspective and biases and its influence on our own doctrine.²³ Finally, as a contemporary testament to our lack of a doctrine process, we continue to struggle with space doctrine. After some 30 years of space operation during peace time, crisis and war, and gaining considerable operational experience, we continue to have deficient space doctrine.²⁴

Having answered the "why now," what is the argument for a "process?" In 1984, Colonel Cliff Krieger, former director of HQ USAF doctrine development, stated, "Since there is no best doctrine (only a better one) Air Force doctrine will never be completed or finished."²⁵ There are several drivers of or influences on doctrine, which are discussed specifically later, that necessarily compel doctrine to be dynamic to be relevant.²⁶ Moreover, the future conflict environment promises to be more complex with regard to what combat leaders and managers have to command and control. For example, General William E. DePuy describes an astounding growth of battlefield functions, such as intelligence, reconnaissance, maneuver, from 11 in the days of Clausewitz to 30 projected in an Airland Battle scenario.²⁷ With this magnitude of synergistic complexity and to

preclude future operational failures, a distinctive process for developing doctrine must become an institutional part of our Air Force culture.²⁸ A rigorous process is the only answer to the charge by a Rand Corporation report which describes US doctrine to be, "more of a play it by ear approach."²⁹ Finally, better doctrine notwithstanding, what benefits would the Air Force accrue from a doctrine development process? Lieutenant Colonel Price Bingham of CADRE argues correctly that we could expect four pay-offs. First, a process would ensure more science and logic based doctrine versus inferential or assertion based doctrine. Second, a process would highlight potential and actual doctrinal inconsistencies, assumptions, and contradictions. Third, a process would promote doctrinal dynamism and responsiveness. And finally, a process should establish institutional credibility and therefore loyalty and harmony among the professional airmen war fighters.³⁰ As a capstone benefit, we believe a doctrinal development process would ensure institutional management of a dynamic and vital aspect of our preparation for the application of air power in future conflict.

Air Force Doctrinal Development Heritage

Doctrine Origins

The concept of a war fighting doctrine can be traced back to the Roman legions. Roman commanders followed training and organizational standards and executed "tactical recipes" that had worked for several centuries. The recipe or doctrine was known and understood by every officer and soldier and eventually was codified in an "idealized" form in the fourth century.³¹ Later, great generals such as Frederick the Great and

Napoleon conducted war using doctrine, but it was a personal doctrine distilled through individual thought, reason, and experience.³² As we recall from Chapter I, the word doctrine has been around since the 14th century. In the 19th century, doctrine was first linked to Prussian military schools where academic discipline specified that "before there could be good 'practice' (that is doctrine), there must be a good theory."³³ Nevertheless, the terminology "military doctrine" is relatively new, not entering the military lexicon or dictionaries until 1950.³⁴ By the late 19th century, the political and bureaucratic complexity of war and the rapidly intensifying weapons technology diminished the ability of a great captain to dictate a personal doctrine for war for large armies.³⁵ Thereafter military doctrine became a subject for theorizing and debate.

Air power theory first emerged in 1921 from an Italian Army artillery officer, General Giulio Douhet, who had commanded one of the first Italian army air units. He formulated his initial theories by 1915 based on experiences in World War I (WW I). Although much of what Douhet professed was not original to him he is credited with believing that aircraft altered the fundamental nature of war. In fact, "he argued the case at a level of abstraction and generalization that elevated argument to principle and the body of thought as a whole to theory."³⁶ Douhet therefore was an extension of the past great generals who personally developed and executed doctrine. He developed a doctrine but then was compelled to sell it to a consumer. As Kohn and Harahan posit in their introduction to Douhet's *The Command of the Air*, "he synthesized and articulated a body of thought that occurred in whole or in part to many others" that "his theories had a sweeping boldness and grandeur that his critics could not match."³⁷

Douhet further introduced a view of war which based success on technical means.

This predilection, of one man's theory equals doctrine, continued unabated into the 1930's led by airmen such as US Army's Brig. Gen. Billy Mitchell and Britain's Maj. Gen. Hugh Trenchard. They accepted Douhet's notion of the fundamental importance of air power and extended doctrine by approaching it as an engineering science. They tended to be optimistic about future aircraft capabilities and based doctrinal arguments on hope and imagination. Further, they preached air power theories and supporting doctrine based not on concrete historical analysis or evidence from WW I, but rather on their assertion of what air power could do if properly applied.³⁸ General Holley describes Billy Mitchell as "a romantic in an era which called for disciplined analysis in an increasingly complex high tech field."³⁹ In summary, the Army Air Service in the late 1920's did not have a doctrine process.⁴⁰ The early air power heroes and prophets tended not to develop doctrine using any rigorous process but rather take up and proselytize a concept or theory which supported their agenda—a separate air service.

Air Corps Tactical School (ACTS)

The year 1931, marked a turning point for doctrine development when the ACTS was moved from Langley Field, Virginia to Maxwell Field in Alabama and was designated the center for air power doctrine.⁴¹ This separation from mainstream operations provided an almost ideal academic setting for stimulating creative thought.⁴² Starting with essentially a clean doctrine slate, a small staff of air power experts labored diligently

between 1931-1941 to develop doctrine for the modern Air Corps.⁴³ Using creative imagination and theoretical extrapolation and Billy Mitchell's bombardment concept, the ACTS formulated, in their minds, the fundamental air power concept that strategic precision bombardment could swiftly destroy a nation's means and/or will to wage war.⁴⁴ This concept shaped our basic Air Force doctrine well into WW II and beyond.⁴⁵ However, creative genius notwithstanding, the early air power enthusiasts developed doctrine from theoretical extrapolations based on a very narrow WW I historical base.⁴⁶ Further they formulated doctrine, which has hence been proven to be flawed, by a means which ignored three principles of a sound process. One, they based conclusions on erroneous assumptions (fast bombers will always elude fighters); two, they developed conclusions which lacked substantive WW I combat experience corroboration; and finally, they lacked a process which had adequate built-in mechanisms for rigorous evaluation and professional criticism.⁴⁷ The results were doctrine development in isolation without adequate grounding in historical experience (lessons learned) and without adequate checks and balances which challenge ideas and theories.

Nuclear Age

In the years following WW II, aerial warfare doctrine evolved little. Following the establishment of the Air Force as a separate service, a series of doctrine manuals (AFM 1-1 Basic Air Force Doctrine) were written. These doctrine pronouncements preserved ACTS' conclusions and essentially reflected the then (and now) American perception of war -- war which resembles a predictable physical phenomena which we approach as an

engineering project hoping that better technology will make the difference.⁴⁸ In essence, the advent of nuclear weapons of mass destruction was viewed as the ultimate validation of both the bombardment and technology theories.⁴⁹ Airpower doctrine languished and as Watts and Hale noted, "Air Force doctrine went stale during the 1950s," and "even by the 1970s we had failed to perfect 'semantic thought patterns' encompassing the totality of its rationale."⁵⁰

As evidence for the lack of significant doctrine development, one only needs to reflect on the statement made by General Curtis LeMay at the 1961 Air Force Association Convention, "I think we have been consistent in our concepts since...1935. Our basic doctrine has remained generally unchanged since that time."⁵¹ Lt. Col. Watts further laments doctrinal progress in his seminal work on the foundations of Air Force doctrine, "The early assumptions underlying mainstream US doctrine for conventional air warfare have not evolved appreciably since Air Corps Tactical School (ACTS) theorists elaborated their theory of precision, industrial bombardment during the 1930's."⁵² Our latest version of AFM 1-1 was published in March 1984, and as Colonel Drew of CADRE asserts in a January 1990 article about the American air power doctrinal dilemma, "Although things have improved significantly since 1979, basic American air power doctrine remains quite unremarkable."⁵³

To attempt to highlight the need for and the benefit of a doctrine process, we will next look at three other military institutions, the United States Navy and Army, and the USSR which have varying degrees of a doctrine process.

Military Doctrine Development Models

United States Navy

We start with the Navy because admittedly it is the easiest. The Navy has no comparable doctrine to our AFM 1-1.⁵⁴ Nor does the Navy have a doctrine development system, although it claims to have a process as depicted in Figure 1. In point of fact, the Navy does not publish its basic doctrine in a single source document. However, it does have "distributive doctrine", that is, doctrine which is spread throughout the service is Naval Warfare Publications (NWP) but is not labelled as doctrine. However, these NWP's fall under the purview of the Chief of Naval operations for review and approval.⁵⁵ There is apparently a move to codify Navy doctrine at the "macro" level (Air Force Basic Doctrine level) and publish it in a NWP 1-A.⁵⁶ Essentially, the Navy views its basic doctrine as derived or being drawn from the following: existing weapons systems, the maritime environment, politics, maritime law, and to some extent joint and allied doctrine and tactics.⁵⁷ On the level of tactical doctrine, the Navy delegates development to "cells" devoted to tactical development such as the Surface Warfare Development Group and to Fleet Commanders.⁵⁸

United States Army

The Army shares a doctrinal development heritage with the Air Force in as much as the Army did not view doctrine development as an integral part of planning for future wars. In the post WW II years the Army expended little effort in developing doctrine, choosing instead to husband the traditional European, industrial enemy nations with large armies scenario.⁵⁹ Army doctrine became rigid and dogmatic and the institu

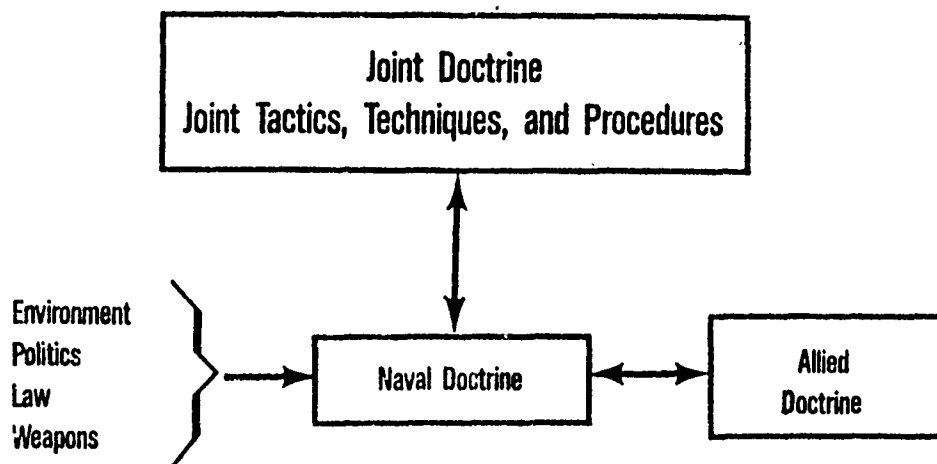


Figure 1

Source: Chief of Naval Advisory Group, HQ Air University, Maxwell AFB, AL: Undated letter (received November 1989), with attachments, pp. 11

tion suffered from 'doctrinal blindness.'⁶⁰ US nuclear doctrine of deterrence and strategies such as massive retaliation and mutual assured destruction further exacerbated the Army's doctrine dilemma. With the Air Force's virtual monopoly of nuclear delivery means, the Army's contribution toward future wars appeared to diminish dramatically.⁶¹ Nevertheless, the Army attempted to deal seriously with the development of doctrine in June 1954 when it established the US Continental Command (USCONAR) whose mission included developing Army doctrine.⁶² Although this was a start toward a process or system, there was more smoke than fire because doctrine development became more of an organizational development effort than doctrine research and development. The 1960's found Army doctrine trapped in a 1944-45 time warp, a western European continental war concept, in spite of US, Korean and British and French southeast Asian experiences.⁶³ Moreover, during the post WW II decades, the Army focused a greater emphasis on new

weapons systems development than on the development of doctrine for the employment of existing systems and the new systems being developed and procured. Consequently, during Vietnam, the Army attempted to graft new weapons employment onto old doctrine and attempted to fit dated doctrine to a people's war and insurgency conflict in a fog-shrouded jungle environment.⁶⁴

What followed in the post Vietnam period can be viewed as traumatic and exciting. The Army embraced the notion that its doctrine must be a living body, not a writ of immutable laws because it was the most important product of their attempt to prepare for future war.⁶⁵

Army leaders undertook a harsh reassessment of their doctrine in the early 1970's based on the following:

1. Experiences and lessons learned in Vietnam
2. A reorientation from an infantry and air-mobile structure used in Vietnam back to a more combined arms large scale strategic theater war
3. An acknowledgment that the Army was still firepower or attrition dependent versus maneuver oriented
4. 1973 mideast war lessons regarding the lethality of modern weapons and the effectiveness of combined arms
5. And finally, war gaming analysis which consistently projected failure using current doctrine.⁶⁶

What emerged was the establishment of an Army institution known today as the Training and Doctrine Command (TRADOC) whose mission included the formulation and promulgation of Army doctrine.⁶⁷ Under the leadership of Generals William E. DePuy and Donald Starry, TRADOC developed organizations, established principles, and set the basic approach which were used

to develop new doctrine. These include:

1. Doctrine must be taken out of the abstract and be developed with cold, hard facts.⁶⁶
2. "Operational concepts" (such as deep attack) must be developed first before doctrine is formulated.⁶⁹
3. Operational concepts do not become doctrine until tested, approved, and accepted.⁷⁰
4. Doctrine derives from objective analysis of missions and threats.⁷¹
5. Examine most recent military experiences.⁷²
6. Develop weapons effectiveness data.⁷³
7. Balance historical experience with equal emphasis on the technology, missions, and environments of the near and distant future.⁷⁴
8. Engage in a continual and deliberate study, critique, analysis, and refinement of doctrine.⁷⁵

From these beginnings, by 1979 TRADOC developed a management system for the Army's doctrine program and attempted to institutionalize the doctrine development process.⁷⁶ This system further evolved into the current Concept Based Requirements System (CBRS) which was supposed to integrate the development of doctrine with the Army's development and acquisition of material and weapons systems.⁷⁷ However, the CBRS is primarily the Army's system to blend all relevant aspects of land war fighting, from an abstract fighting concept to weapons employment, to develop logical force structure, employment doctrine, and to rigorously support the acquisition of new required weapons systems. TRADOC Reg 11-15 describes CBRS as:

. . . a systematic and flexible approach to determining future Army needs and resolving deficiencies in current battlefield capabilities. As the name implies, a concept of what the Army must do on the battlefield drives the process. What must be done is derived from challenges for the Army of the future. CBRB is based on an in-depth examination of the current umbrella concept, current and future missions, current and projected worldwide threat, historical experiences, and technological forecasts. The CBRB is a comprehensive, front-end approach to attain the Army goal of a balance among readiness, modernization, sustainability, and force design.⁷⁸

Figure 2 depicts the Army's CBRB. It is composed of four phases: developing a war fighting concept, determining capability deficiencies, developing corrective actions, and fielding, and evaluating results. Within this rather comprehensive and we believe very effective approach to ensuring ready and capable combat forces, doctrine development appears as an initial step of the "corrective actions" phase: Coordinated Development of Doctrine, Training, Organization, and Materiel.⁷⁹ However, the process or methodology for developing or revising the doctrine component of this CBRB is not prescribed in like detail. Nevertheless, in spite of an elegant process with an effective organizational and development structure, TRADOC regulations and manuals do not present a coherent process which guides the actual development of the war fighting doctrine. There are identifiable doctrine staff functions with mission statements, management and supervision responsibilities, and precise administrative procedures, but no clearly articulated process.⁸⁰ To illustrate, TRADOC Pamphlet 350-8, TRADOC PRIMER, portrays the doctrine development process as field manual development, with standard procedures from outline of final product.⁸¹ General Holley gives the Army credit for institutionalizing doctrine development within an organization, TRADOC, but with regard to a rigorous doctrine development process he laments, "TRADOC doesn't have a 'system'."⁸²

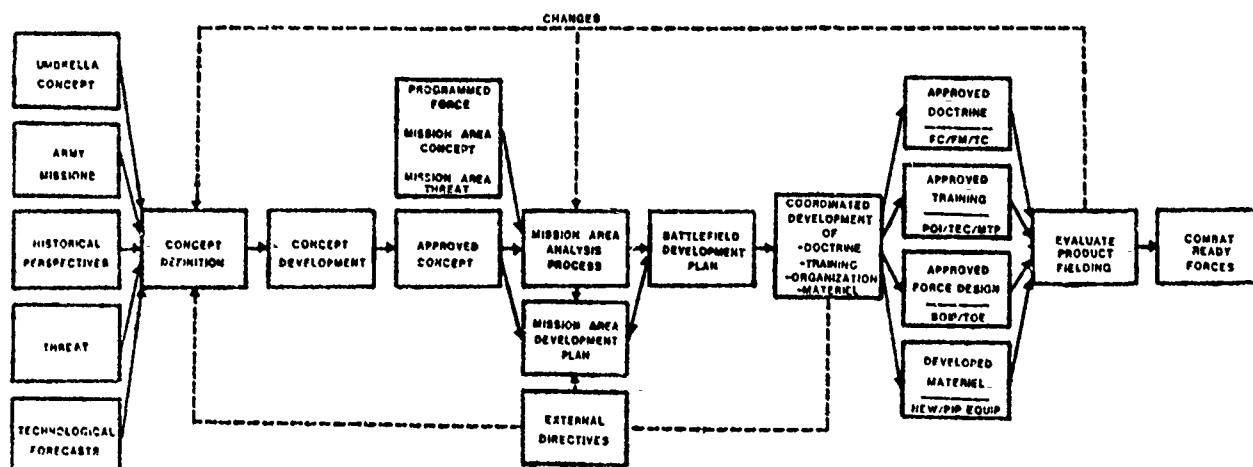


Figure 2

Source: US Army TRADOC Regulation 11-15, *Concept Based Requirements System*, (Department of the Army, Fort Monroe, VA: 4 Aug 86): pp 2-13, Figure 2-10.

Soviet Union

Why examine the doctrine development process of the Soviet Union? Regardless of what one thinks about the Soviet Union's Communist system, one must admit that no state in the world today rivals the Soviet Union in its combination of size, sophistication, and command and control of military forces.⁸³ The Soviet military is proud of their forces and their sophisticated military doctrine and theory development. Soviets consider their doctrine to be a great national asset representing a concentration and distillation of military wisdom and experience, constantly being refined, amended and improved by experiment, exercise, and reevaluation.⁸⁴ Some experts credit Soviet military theory as being the force behind a "tenth rate economic power encumbered with obsolete political doctrine to become a military superpower."⁸⁵ The Soviet Army holds dear the convic-

tion that they possess a fundamental advantage for having superior military doctrine, based on a deeper and more correct understanding of the laws and principles governing warfare. Their thesis is that the better one understands the meaning of the principles and laws of war, the better one can apply them to greater military advantage.⁸⁶

To understand the Soviet doctrine process, you first must understand the social-political-military context—in short you must appreciate the fundamental underpinnings of Marxism-Leninism. Marxist-Leninist political theory postulates that violent armed class struggle is an inherent part of historical change.⁸⁷ Lenin extended this political philosophy beyond the ideological struggle, by borrowing from Clausewitz when he asserted that, "war is a tool of policy."⁸⁸ Soviet writers firmly link the political-military philosophy when they assert, "the most important concepts of the Marxist-Leninist teachings on war and the army, reflecting the essence and content of war, are an instrument in the ideological struggle."⁸⁹ Second, you must recognize that the sequence of doctrine development is important. The intellectual process starts with ideological assumptions and propositions about the historical process of class struggle and international relations, then evaluates the nature of technology. Then lastly makes judgements on forces, socialists versus capitalists, as well as available soviet military, social and economic resources.⁹⁰ Therefore, it should not surprise us that it is natural for the Soviet military profession to develop an infrastructure devoted to the serious intellectual study of the theory and practice of war and armed combat and the development of doctrine.⁹¹ Figure 3 depicts the relationship between doctrine and ideology.

leadership of what they believe is best in the areas of military affairs, and as such is "absolute" and "immutable."⁹³

We can more reasonably examine Soviet military doctrine development by separating the two components and looking at the military-technical aspect. However, before progressing, a point of clarification. Soviet military doctrine applies across the board for all services and combat arms. No distinction is made at this level of abstraction between Soviet air power, naval or army doctrine. Furthermore, Soviet military doctrine extends to weapons systems design institutes and academic staffs as well. Soviet military doctrine is not necessarily a regulation, rather it is an all encompassing, pervasive military philosophy which is applied to the entire military system as the military component of Marxist-Leninist Doctrine.⁹⁴

Since the Communist Party controls the development of doctrine, the professional military establishment or "Kadre" has no authority to formulate military doctrine. However, professional military influence in the political arena is extended indirectly through the Minister of Defense, who is part of the Politburo, various institutes and the science academies populated with military members, and by military members in the Central Committee and in the Supreme Soviet.⁹⁵ Left with only marginal and indirect influence on the political level, how then does the Kadre develop military combat doctrine of a nature that we recognize similar to our own? The answer comes from recognizing that there are four main factors that have historically contributed to the formulation of modern Soviet doctrine. They are:

1. Marxist-Leninist ideology
2. Effects of the Russian environment and the Tzarist tradition (harsh autocratic)
3. Experience of the Russian Revolutionary War and the 1941-45 Great Patriotic War.
4. Impact of Modern Technology

The balancing of these four factors over the years has produced a remarkable and consistent Soviet approach to war.⁹⁶ The last three factors represent the domain of the Kadre. The study, analysis, and development of military operational laws (doctrine) distilled from the Russian tradition, the experience of two great wars, and finally the relationship and impact of technology is accomplished through military science by the Kadre. As explained by William Baxter, "modern Soviet military philosophy... is governed by laws expressing its unique nature... a function of three parameters: technology, history, and ideology."⁹⁷ Military science is more closely related to U.S. military doctrine. It is however very much structured and scientifically based. The Russian perception of science is narrow, and more pragmatic than the west's concept of science as "theoretical knowledge."⁹⁸ To the Soviets, military science is the theory of military matters, which relies on the analysis of objective laws and the independent human will, and on the practice of combat. It is also an application of knowledge.⁹⁹ The Soviets define military science as "system of knowledge concerning the nature, essence, and content of armed conflict, and concerning the manpower, facilities and methods for conducting combat operations by means of armed forces, and their comprehensive support."¹⁰⁰ War is studied as a science, because war is considered a process governed

in much the same way as natural phenomena. That is war is comprised of a number of facts—some essential, some not—and the object of military science is to recognize the essential and discard the irrelevant. The methodology is a continuous process of examining and revalidating the essential facts, and refining the "laws" ¹⁰¹

The Soviet practice of military science is a process and a rigorous process at that. It is characterized by the interaction of four elements: structure or organization, modelling, field exercise, and scientific/technology foresight.¹⁰² Figure 4 depicts the structural aspect, the unified nature of military science as a single discipline which establishes an interrelationship between six principal parts of military science.¹⁰³

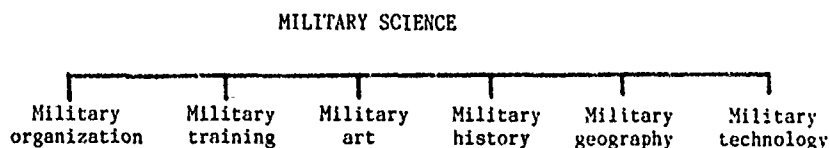


Figure 4. The Structure of Soviet Military Science

Source: William Baxter, *Soviet Airland Battle Tactics*. (Novato, CA: Presidio Press, 1986): pp 20.

Of the six, the exhaustive study and analysis of military history and art are the most important. The scientific interpretation of historical experience provides the laws of war. Military art (not to be confused with operational art) addresses strategy, operational art and tactics and their interdependence.¹⁰⁴ Within military art, the study of operational art would

appear to be a major contributor to the doctrine development process and is divided into eight distinct tasks.

1. Investigate the rules, nature, and character of contemporary operations (combat action).

2. Work out the means for preparing and conducting combat operations.

3. Determine the function of large units (fronts, armies) and formations (divisions) of the armed forces.

4. Establish means and methods for organizing and supporting continuous cooperation, security, and command and control of forces in combat.

5. Delineate the organizational and equipment requirements of large units of the armed forces.

6. Work out the nature and methods of operational training for officers, and command and control organs.

7. Develop recommendations for the operational preparation of a theater of military operation (TVD).

8. Investigate enemy views on the conduct of operational combat.¹⁰⁵ The tasks are illustrated in a relational sense in Figure 5. The Soviets use models much the same way we do—to provide understanding of an interactive system and to capture the essential or important features in something simpler than the complex phenomena. They model military operations for study and problem solving and they construct weapons delivery or fire models to study battle field effectiveness.¹⁰⁶

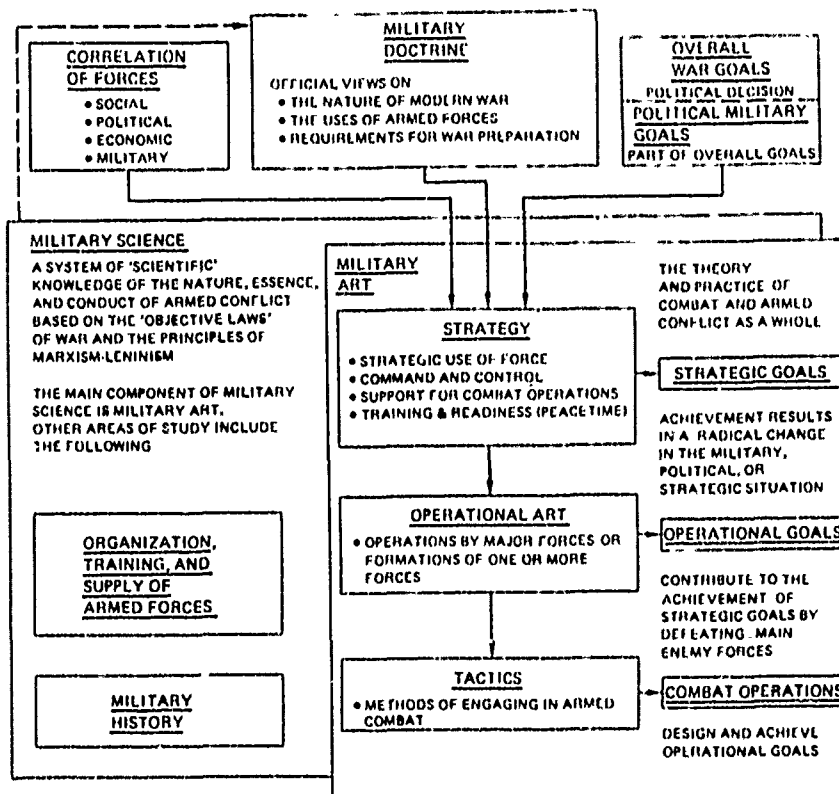


Figure 5. Schematic Relationship of Soviet Military Doctrine and Science Technology

Source: John Hemsley, *Soviet Troop Control*, (Elmsford, NY: Pergamon Press, Inc. 1982), p. 18.

See Figures 6 and 7 for examples of Soviet models which address personnel reconstitution and battlefield advance problems. They further use statis-

tical techniques along with historical combat data to establish "norms" for every aspect of combat operations which form the basis for quantifying standards of performance.¹⁰⁷

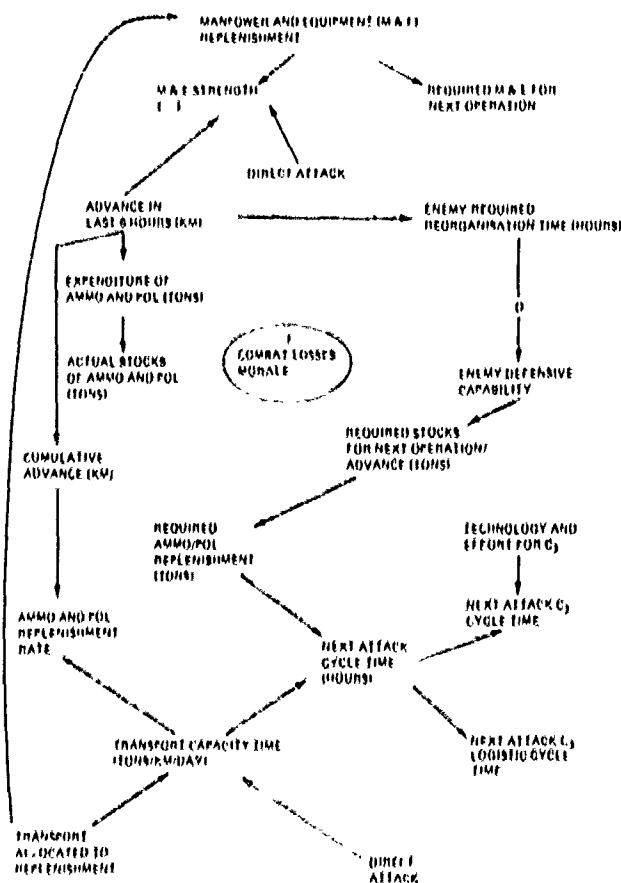


Figure 6. Soviet Manpower and Replenishment Model

Source: John Hemmley, *Soviet Troop Control*. (Elmsford, NY: Pergamon Press, Inc, 1982): pp 70

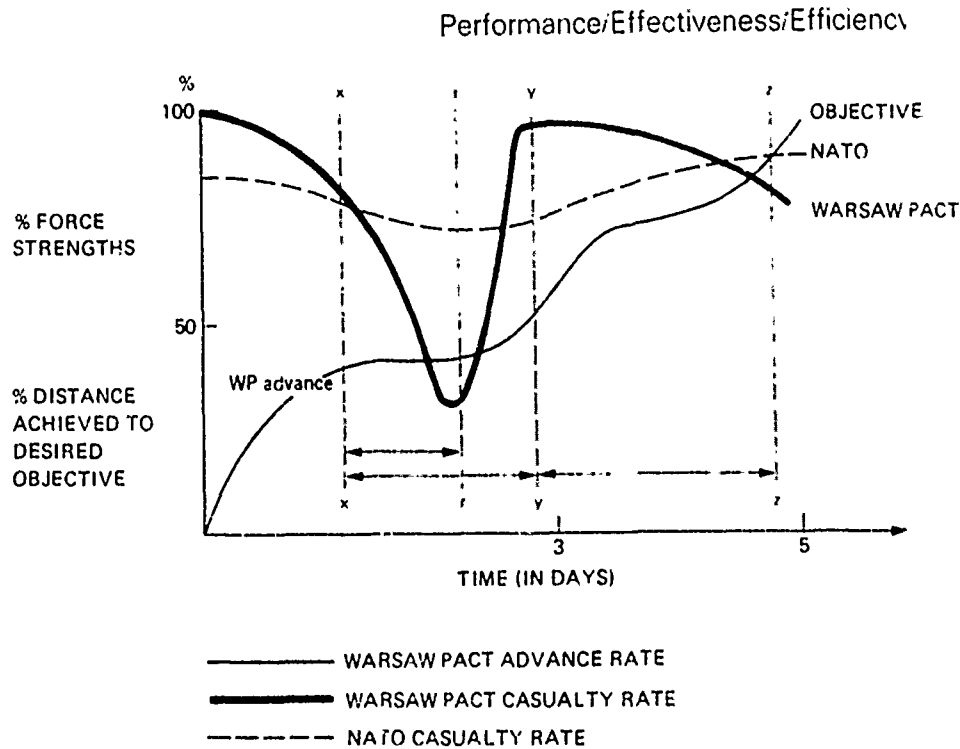


Figure 7. Soviet Model For Combat Advance

Source: John Hemsley, *Soviet Troop Control*. (Elmsford, NY: Pergamon Press, Inc. 1982): pp 79.

Recognizing the need to look beyond today's war, the Soviets employ science and technology (S&T) forecasting. They project where S&T is going, expected breakthroughs, and potential applications for both themselves and their adversaries. They use advanced methods of forecasting such as:

1. Expert questionnaires and interdisciplinary exchange between highly qualified specialists
2. Extrapolation techniques such as probability, gaming and statistical analysis

3. Math and Logic models

4. Complex network planning techniques¹⁰⁸

The fourth element critical to effective Soviet doctrine is realistic field testing or exercises. These may take the form of limited concept testing or full-dress combined armies exercises which test and validate not only individual concepts but the integrated and synergetic effect of a single or multiple interdependent concepts.¹⁰⁹ Results are fed back into the structure for evaluation and the process continues. This process of constant examination of failure precludes the Soviets from being blind to deficiencies.¹¹⁰

In summary, the Soviets possess a doctrine development system that is well recognized and structured to take into account both the political and the military and technical realities that confront them. Their system is based on extensive data collection, rigorous research and analysis, creative modelling, realistic operational testing and a process structure which ensures constant feed back and doctrine refinement.

Principles Of Doctrine Development

Why An Institutional Process?

Why should the Air Force establish a doctrine development process? General Holley provides an illustrative reply in his discussion regarding continuing the Schweinfurt raids in the face of devastating losses, "not exactly a monument to the existing system for devising appropriate doctrine."¹¹¹ General Holley further argues persuasively for a doctrine process when he recounts three separate historical examples which illustrate how new doctrine either succeeded or failed because of the prese-

nance of or the lack of a doctrine development process. Sir William Congreve of the British Royal Artillery developed very effective rocket doctrine in 1805 which was used successfully on one occasion but which failed to be incorporated into routine procedures and practices for British forces. Why, because there was no process or mechanism to promulgate operational doctrine throughout the British force structure.¹¹² A similarly sad example involves British Colonel J.F.C. Fuller who attempted to develop and promulgate Army tank doctrine in 1914. Recognizing the need to institutionalize doctrine development, he also attempted but failed to sell the Army on a carefully structured staff system for deriving doctrine. Neither the new tank doctrine or a doctrine system prevailed and British suffered on the battlefield.¹¹³ A third example illustrates a somewhat successful system. The Prussian Army's Kriegs Akademie taught not only the necessity for standard doctrine but also the need for a systematic process for deriving doctrine from experience. Their process consisted of:

1. Creating two independent commissions of able officers representing all services.
2. Immerse commission in self study of history, art of war, instructive campaign to understand the evolution of doctrine to date.
3. Developing a conceptual outline.
4. Solicit field unit critique or concept.
5. Distill ideas and feed back.
6. Test and experiment.¹¹⁴

Moltke the elder added to the Kriegs process by insisting on careful recording of experiences, rigorous objective analysis and subjecting doctrine to repeated trials.¹¹⁵ The Prussian system was rigorous and self

critical—two important aspects of a process to develop viable doctrine.

Aside from a historical imperative, there are further reasons for a doctrine process. For instance, wide differences in doctrine can be derived from different people studying the same war. For example both the Germans and the French studied Napoleon's campaigns but came to radically different doctrinal conclusions prior to WW I.¹¹⁶ The disastrous results for the French speak plainly. A process also provides a means to confront institutional biases and political influences and enforce rigorous standards of objectivity.¹¹⁷ Further, as Richard Hallion aptly concluded, "...as warfare itself is an integrated and combined arms exercise—as is aircraft design itself—so too should be the development of doctrine."¹¹⁸ Finally, Lieutenant Colonel Bingham argues that a doctrine process is needed to:

1. Persuade—to establish internal Air Force loyalty, harmonize constituencies, and to establish operational credibility.
2. Identify potential or actual doctrinal inconsistencies, and contradictions.
3. Promote doctrinal dynamism.
4. Ensure objectivity - provide science/logic based doctrine versus a "faith" or "inferential" based doctrine.¹¹⁹

Influences For Change

To understand the dynamics of doctrine, one must grasp and understand the influences or drivers which compel doctrine to change. One author suggests that simply put, "doctrinal concepts must change as reality changes."¹²⁰ Another author asserts bluntly, that the "Principal catalyst of doctrinal change is military disaster."¹²¹ However, in addition to

operational failure, doctrine is influenced by the following:

1. External Influences:¹²²
 - a. Alliances
 - b. Spectrum of Conflict
 - c. Joint and Combined (Allied) operations
 - d. Location (jungle, desert ...)
 - e. Pace of Technology
 - f. Threat
2. Internal
 - a. Underlying assumptions
 - b. Budget
 - (1) Weapons
 - (2) Force Structure

Doctrine Development Theory

Having discussed why we need a doctrine process and the influences and drivers for doctrinal change, we turn now to examine how to construct an effective doctrine development process. We believe that doctrine development must have an ethic or a spirit, and that spirit should be an overarching principle which guides the process. That spirit should be that doctrine development is "A search for the truth," which attempts to determine the true nature of war (past, present, and future) and to determine cause and effect relationships for the phenomena in war.¹²³ In addition to a spirit, a doctrine process should possess certain characteristics which will maximize the probability that the process output will be effective doctrine. The following is a list of process characteristics which we believe are minimum and essential.

1. Iterative/Feedback System. Doctrine should be in a continuous state of study, critique, analysis and refinement.¹²⁴ An analogue may be the flying safety program. Instructor and student fly a mission then review the flight. Since there are rarely any perfect flights, there is feedback, adjustment and refinement. Result—skill should and does improve.¹²⁵

2. Intellectual freedom with external checks. Doctrine development should be free of internal/external political influences and procedures, but not free of external checks and balances. Merit and valid field tested success should be the judges. Political considerations and people change -- facts do not.¹²⁶

3. Analysis. Critical analysis coupled with sound reflection and rigorous testing will provide provable convincing evidence, irrefutable logic and more likely correct insights.¹²⁷

4. Debate. Public debate provides the medium to expose ideas and concepts, involve many Air Force professionals, and promote competition in market place of ideas. The Army credits "spirited doctrinal debates" with playing an important role in their process to develop the new Airland Battle doctrine.¹²⁸

5. Institutional visibility. A highly visible doctrine process, clearly articulated in official publication, which is accessible to professional Air Force members should promote an understanding of the process.¹²⁹ Within the process, there must be a legitimate "audit trail" to enable participants to assess doctrinal validity from the fundamental concept to current application.¹³⁰

6. Responsive. A process must be responsive to change. It must be open and accessible, deliberate yet streamlined, and kept free of bureaucratic impediments.¹³¹

7. Institutional Consensus. A doctrine process should achieve consensus through widespread participation. As Admiral Knox surmised, "Human nature is so constituted that perfect loyalty and cooperation is almost impossible unless participants are inwardly convinced of the correctness of the plans and methods under which they are mutually acting."¹³² Participation, consensus and ultimately individual ownership of Air Force doctrine should make professionals more effective.

8. A simple process or methodology. General Holley suggested a three phase doctrine process of collection, formulation, and dissemination.¹³³ We would suggest four phases to include evaluation. These phases could be described as follows:

a. Collect

(1) Study and analyze military history -- it is recognized as the preeminent source for doctrine.¹³⁴ Watts and Hale assert, "Any attempt to develop concepts, doctrine, or principles for the actual practice of war that fails to ground itself squarely in concrete battle experience risks outright disaster."¹³⁵ In addition to our military history, we must study and analyze combat experiences and military history of other foreign and allied nation; combat simulations, exercises, maneuvers; and war games.¹³⁶

(2) Analyze. We should conduct our own military operations analysis because it provides a means to discern truths not discoverable through experience or trial and error. ¹³⁷ Further we should review the

analysis of other experts who can provide additional insights.¹³⁸

(3) Identify Assumptions. We should unflinchingly identify and expose all assumptions and biases which affect our conclusions.¹³⁹

(4) Theorize. Developing theory is the means to deal with the future. A lack of combat experience or the need to forecast future conflict scenarios requires creative conceptual thinkers and theorists. The combination of theory and experience provides the basis of synthesizing effective doctrine.¹⁴⁰

b. Synthesize. This is a challenging phase where doctrine must be drafted, reviewed, debated, revised, and coordinated in a spirit of unconstrained intellectual freedom and inquiry. The process should foster a dialectic through the professional journals, symposiums and conferences.¹⁴¹

c. Evaluation. The critical phase of doctrine development is the testing and evaluation of the "goodness" of doctrine. Rigorous field testing, war games, simulations, maneuvers, exercises in all scenarios and through all appropriate spectrums of conflict and particularly in a joint operations arena are necessary to validate the doctrine, discover flaws and to feed back success and failure into the development process for analysis and refinement.¹⁴²

d. Dissemination. Once developed, doctrine must be widely disseminated to all military people through initial indoctrination and orientation, technical training, Air Force technical and professional publications, and continuing education such as professional military education.¹⁴³

A Notional Doctrinal Development Process

This section attempts to synthesize a notional doctrine development process which incorporates all the best features of historical and current U. S. and Soviet development processes. The concept is notional since we do not attempt to define specific time phases or output products or documents, or assign responsibilities to particular agencies. It is graphic in nature so as to illustrate a flow and the interrelationships that should exist. Figure 8 depicts the notional process.

Doctrine development cannot ignore two significant influences which are front-end loaded: (1) National level defense policy and threat assessment provided through the defense department (OSD), and (2) constraints and capability limitations which are provided by the Department of the Air Force, in the form of budget, force structure, and conflict definition as derived from OSD guidance (global, theater, regional . . .) The reason that there are two powerful influences up front that set the bounds for airpower doctrine development as opposed to doctrine being driven by the threat for instance, is because in our democratic culture the public, through the executive and legislative organs of our government, determines the "how much" portion of our military capability. The most vigorously derived, tested and validated doctrine is of no value if (1) the nation will not support it, and (2) if the national treasury will not fund the implements to support it.

Moving to the heart of the notional process, we suggest that there are four fundamental phases: collection, synthesis, evaluation, and implementation. The collection, synthesis and evaluation phases constitute the process which should be managed by a doctrine development

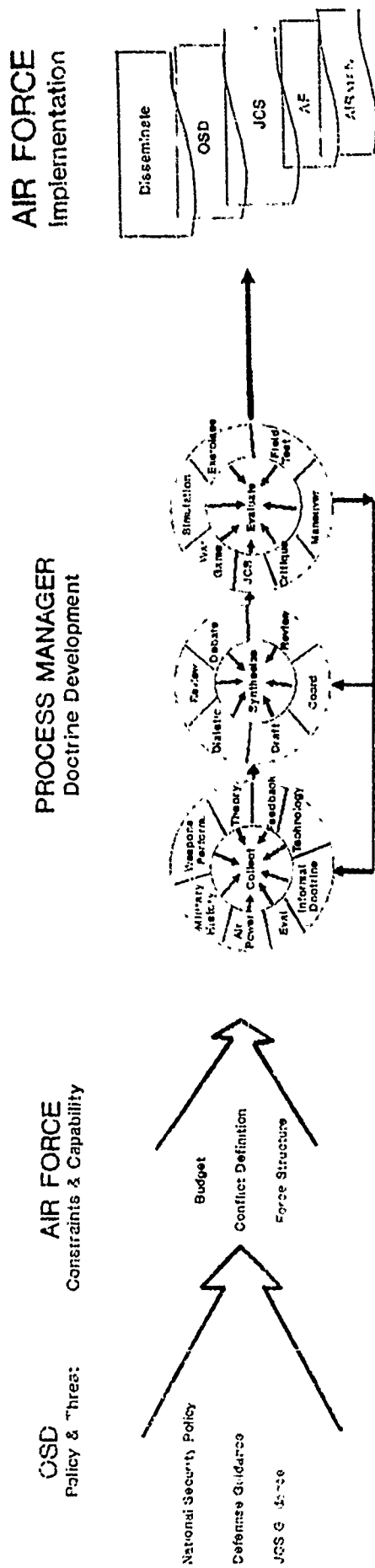


Figure 8. A Notional Doctrine Development Process

process manager -- an organization charged with the integrity of the process and the smooth interaction of the various elements which guarantee an output of effective doctrine. This manager function is identified and defined in a subsequent chapter. The core functions are depicted by integrated circles of activities progressing left to right representing the discovery or input of individual datum, to the creative and innovative function, and finally a "goodness" validating function. Note importantly that each individual core function is subject to feedback from other functions, thus assuring dynamism and responsiveness to change.

The collection phase is characterized by an attempt to collect, analyze and assess all sources of data which affect doctrine. This includes but is not necessarily limited to intellectual study and critical analysis of military and airpower history's critical assessment of current U.S. Allied and adversary formal and informal doctrine; evaluation of the individual and integrated effects of weapons performance; and the potential influence of current and emerging technology. The process manager could organize professional committees of acknowledged experts to meet, review and judge doctrinal literature and articles for use in developing a doctrine data base. This is commonly done in other professional organizations to monitor a variety of sub-specialties. For example, in medicine, the American Medical Association has a Oncology (cancer) or orthopedic committee which stays abreast of technical developments and scrutinized and evaluates specialty literature for innovation and technical break-throughs which are valid for widespread dissemination.

From a database or reservoir of doctrinal data, you move into the creative function -- to synthesize or revise a doctrine. This includes the

actual writing and drafting of the doctrinal statement, the submitting for review, the creating of opportunities for formal debate and dialectic and finally the publishing of a doctrine statement for test and/or the feedback to the collect function for new data.

Putting the new doctrine to the test is the last function. New doctrine is now critically evaluated individually and in concert with other doctrinal concepts in joint service war games, large scale exercises and maneuvers, JCS simulations, and other realistic and "dirty" field test. From these, a doctrine analysis is derived proclaiming either a suitable and effective doctrine or feeding back either into the collect or synthesize functions or both a need to relook the doctrine. If effective doctrine is the result, the doctrine is then institutionalized through dissemination from top to bottom. Chapter Four discusses further how doctrine is used to organize and train our air forces to win.

To summarize, this notional process focuses on the need to:

1. Incorporate national defense and Air Force influences at the front end of the process.
2. Define an orderly progressive process of reinforcing and interactive functions which yield a validated product.
3. Provide for development functions which exploit all available data, focuses creative energy to synthesize doctrine and rigorously tests the product.
4. Provide feedback linkage between all development functions to ensure dynamism and real world responsiveness.
5. Finally, provide a doctrine development manager which ensures the integrity and effectiveness of the institutional development process.

Recommendations

Implementing a doctrine development process on an institutional level is a daunting task. However, the development of a notional process, the concept presented herein, is a first step. The second step is to convince senior Air Force leadership, through Air University and CADRE specifically, that to create a robust process, the Air Force must first revise AFM 1-2. AFM 1-2 already has the objective of assigning responsibilities. It follows therefore, that as a "manual" it should also provide an outline of the "how to."

We face a near term future of great uncertainty, not only in the perceived threat from our historical adversaries, but also in the spectrum of threat ranging from narco-terrorism to third-world or regional conflicts. In addition, our own national goals and objectives and our national security policy and force structure are changing or will change at a breathtaking pace. Consequently, we face almost certainly the challenge of developing doctrine which must be effective when using our military instrument of power now and in the future. A robust doctrine development process should ensure that we synthesize the best way to conduct air power operations instead of relying on our eroding ability to "play it by ear."

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CHAPTER III

UNITED STATES AIR POWER DOCTRINE RESPONSIBILITIES

by Lt Col Steven J. Redmann, USAF

Introduction

At the very heart of warfare lies doctrine. It represents the central beliefs for waging war in order to achieve victory. Doctrine is of the mind, a network of faith and knowledge reinforced by experience which lays the pattern for the utilization of men, equipment, and tactics. It is the building material for strategy. It is fundamental to sound judgment.

General Curtis E. LeMay, 1968

As General LeMay acknowledged, doctrine is not only fundamental, but crucial to the successful art of warfare. If doctrine is so vitally important, who has the responsibility for developing air power doctrine? Where has the responsibility been? Where is the responsibility today? Where should it be? These questions are basic, but the answers are not readily apparent. The fact is that air power doctrine responsibility has been a fragmented effort over the years. Even today's air power doctrine development responsibility is misunderstood by many. To fully understand the air power doctrine responsibility issue, an additional historical overview is helpful.

Where Have We Been?

Although Orville and Wilbur Wright first demonstrated controlled-power flight at Kitty Hawk, North Carolina, on 17 December 1903,

aviation wasn't established in the military until August 1907. The Army placed the air arm in the Signal Corps' Aviation Section. The initial Army concern with the air arm was an organizational one, the control and purpose of the aviation component.¹ In terms of air power doctrine, the General Staff of ground officers controlled the formulation and dissemination of all combat doctrine, and subordinated the air manuals to suit their taste.² At the beginning of World War I, despite the opinions of air officers, the Army had no notions of air power except to aid field armies.³

It wasn't until the autumn of 1917 that the first formal statement of air power doctrine appeared. Colonel William Mitchell wrote and distributed a paper entitled, "General Principles Underlying the Use of the Air Service in the Zone of Advance, A.E.F."⁴ He had no responsibility for air power doctrine, primarily because the army considered air units to be an integral combat arm of the ground forces, but he wanted a vehicle to guide the air effort through World War I.⁵ Mitchell continued to espouse doctrine through his writings, such as, "Tactical Application of Military Aeronautics," and became a most articulate proponent of air power.⁶

The army gave the first assignment of air power doctrine responsibility to the Air Service's Training and Operations Group, commanded by Mitchell. By 1920, Mitchell's adamant insistence on the need for an independent aviation corps resulted in the War Department General Staff directing General Charles T. Menoher, Chief of Air Service, to bring Mitchell in line. General Menoher subsequently relieved Mitchell of command of the group and transferred influential members of the group, Majors Thomas D. Milling and William C. Sherman, to the new Air Service Field Officers' School on 25 March 1920. The group remained grossly under

manned. These actions severely hampered any doctrine efforts from the Training and Operations Group.⁷

Reorganization in the Office of Chief of Air Service, by General Mason M. Patrick on 1 December 1921, resulted in a name change of the Training and Operations Group to the Training and War Plans Division. Although the division was to keep air doctrine responsibility, they essentially passed it on to the Air Service Field Officers' School at Langley Field, Virginia.⁸

The Air Corps Act of 1926 resulted in the Chief of the Air Corps being responsible for preparation and issuance of doctrine for all Air Corps organizations. However, the War Department General Staff still reviewed all reports.⁹ Once again, because of small numbers of officers on the Air Corps staff, the Chief of Air Service assigned the Air Service Field Officers' School the doctrine duties. The Army Air Corps hand-selected the Air Service Field Officers' School faculty, they were the best of the best.¹⁰ This school became the primary source for many Air Corps ideas, and taught a course named "Air Power."¹¹ Subsequently renamed the Air Corps Tactical School in 1926, "this school proved to be the only common location of experienced Air Corps officers who had enough time for creative thinking."¹²

Another reorganization of the Air Corps resulted in another doctrine responsibility change. In response to the MacArthur-Pratt agreement and the Drum Board Report, the War Department directed the Air Corps, on 27 December 1933, to review and revise its training regulations and to ensure principles and doctrines were disseminated to all units. The Chief of the Air Corps assigned the Air Corps Training and Operations

Division this task.¹³

Despite the MacArthur-Pratt agreement, upon Admiral W. V. Pratt's retirement, the Navy reopened the question of coastal air defense belonging to the Army. As the discussions and debates ensued, General Douglas MacArthur decided the Army should arrive at a unified position on aviation. He subsequently directed the War Department General Staff to define facts, principles, and doctrines relating to the Army Air Corps, not the Air Corps itself. The War Department General Staff printed their work as War Department Training Regulation No. 440-15, *Employment of the Air Forces of the Army*, on 15 October 1935.¹⁴

In December 1935, when General Benjamin D. Foulois retired as Chief of the Air Corps and General Oscar Westover moved up, General Westover directed further doctrinal studies. Theoretically, as Chief of the Air Corps he was responsible for doctrine, but in reality he relied heavily upon the Air Corps Tactical School and the Air Corps Board to prepare basic doctrine studies.¹⁵ As a matter of fact, during General Foulois' absence earlier in 1935, General Westover, as Acting Chief of the Air Corps, directed the Air Corps Board to prepare uniform tactical doctrine for all Air Corps units. Eventually, General Westover expanded the Air Corps Board's mission so they would be responsible for developing doctrine.¹⁶

The Air Corps Board critiqued the War Department Training Regulation No. 440-15, and prepared a study, "The Functions of the Army Air Force." Brigadier General H. C. Pratt, Commandant of the Tactical School and ex officio president of the Air Corps Board, sent the study to the War Department requesting approval. The War Department refused. They stated that such strategic questions were not to be part of the Air Corps

manuals.¹⁷ These actions typified the doctrinal conflicts between airmen and the War Department General Staff from the 1920s to the 1940s.¹⁸

In 1938, President Franklin D. Roosevelt emphasized the need for an air power strategy to combat Adolf Hitler's advances. President Roosevelt decided the Army Air Corps' air power and not their ground forces would be able to stop Hitler. Secretary of War Harry H. Woodring appointed General Henry H. Arnold President of the Air Board on 23 March 1939, and charged him to recommend fundamental policies on strategic and tactical air power employment to obtain President Roosevelt's desires. Lieutenant Colonel Carl Spaatz urged General Arnold to first define the Air Corps' mission, doctrine, and characteristics.¹⁹ On 31 March 1939, General Arnold agreed with Lieutenant Colonel Spaatz. The Air Board completed their report and Lieutenant Colonel Spaatz pushed for a rewrite of doctrine. This later project, completed on 15 April 1940, was known as Field Manual 1-5, *Employment of the Aviation of the Army*.²⁰

Early in World War II from 1939-1940, in light of the initial Luftwaffe operations and the vulnerability of unprotected large bomber formations, the Air Corps Board sought to "update" air power doctrine.²¹ As changes were being made, Major General George H. Brett, Acting Chief of the Air Corps, pointed out that, "Army Regulation 95-5 charged the Air Force Combat Command with the development of doctrines of air tactics and techniques of Air Force." Brigadier General Spaatz, Chief of the Air Staff, agreed in July 1941.²²

Meanwhile, the Arcadia Conference in Washington between President Roosevelt and Prime Minister Winston S. Churchill, to decide the issue of unified command of combined forces in theaters of operation, provided the

springboard for the next doctrinal responsibility change. Following the sweeping War Department and Army Air Forces reorganizations that occurred in March 1942, the Directorate of Military Requirements, led by Major General Muir S. Fairchild, was the next air power office for doctrine.²³

During the summer of 1942, the Army Air Forces planned to open the Army Air Forces School of Applied Tactics in Orlando, Florida. On 27 October 1942, the Army Air Forces opened the school. In further developments on 12 November 1942, the Army Air Forces established the Army Air Forces Board within the School of Applied Tactics. The Army Air Forces Board was to determine questions of policy and doctrine.²⁴

While the Army Air Forces expanded and reorganized their Headquarters Army Air Forces in Washington, General Arnold remained concerned that the Air Forces still did not have a compact body of doctrine. Furthermore, each combat zone developed its "own" doctrines, based on its "own" experiences. To consolidate the Army Air Forces positions, General Arnold charged Brigadier General Byron E. Gates, Chief of Army Air Forces Management Control, to prepare a publication of Air Force Theater operations and how to attain Army Air Forces objectives. General Gates finished the project on 1 June 1943: *The Air Force in Theaters of Operations: Organizations and Functions*. "This volume," stated General Arnold, "represents Air Force doctrine. It is not rigid doctrine. It is subject to change when change is indicated."²⁵

Although *The Air Force in Theaters of Operations: Organizations and Functions* was an ambitious and comprehensive doctrine publication, by the time of its distribution, doctrine had changed substantially and most of it was out of date. Therefore, on 9 June 1943, the War Department

directed Colonel Morton H. McKinnon, Commandant of the Air Support Department of the School of Applied Tactics, Colonel Ralph F. Stearley, Commander of the 1 Air Support Command, and Lieutenant Colonel Orin H. Moore, Armored Force Liaison Officer at Army Air Forces Headquarters, to form a board to revise "official" doctrine with respect to theater-proven operations. The result three weeks later was Field Manual 100-20, *Command and Employment of Air Power*, published 21 July 1943.²⁶

Field Manual 100-20, a War Department doctrine manual, caused quite a stir in the Army Ground Forces. After all, it had been written without their concurrence. Additionally, it caused changes to the Army Air Forces Board, Army Air Forces School of Applied Tactics, and the Army Air Forces Proving Ground Command. In light of these developments, Brigadier General Eugene L. Eubank, Director of Tactical Development, in Orlando, revised the Army Air Forces Board. And, by a new Army Air Forces Regulation published on 8 October 1943, the Army Air Forces Board was placed in charge of air power doctrine.²⁷ General Eubank organized an Evaluation Division within the Army Air Forces Board, and the Policy Branch of this division reviewed and determined requirements for doctrine manuals.²⁸

Following World War II, General Dwight D. Eisenhower, Army Chief of Staff, appointed a board of officers to study the reorganization of the postwar Army and Air Force. On 29 November 1945, as part of the reorganizations, the Army Air Forces School was transferred to Maxwell Field, Alabama. Also at Maxwell Field, the Air University was established, with the Army Air Forces School designated as such on 12 March 1946.²⁹

In February 1946 under further reorganizing, General Spaatz directed the development of an Air Board. While examining the Air Board's

mission and in view of the fact the Army Air Forces School was at Maxwell Field, Major General Lauris Norstad suggested the Air University be responsible for doctrine:

...at the Air University hundreds of instructors, spurred on by the sharp analysis and questions of thousands of highly-experienced students would constantly evaluate combat doctrines. They can probably do a better job, resolve a greater amount of sound air thinking into usable doctrine, than any other group of men anywhere.³⁰

On 1 July 1946, the Air University received the responsibility for air power doctrine. They were to review doctrine manuals, research, test, and develop the nation's air power doctrine. Air University specifically employed their Evaluation Division of 18 officers to the doctrine task. With only 18 officers, the Evaluation Division assigned the Air University's schools and colleges the revision and update of doctrine manuals. The Evaluation Division oversaw the process.³¹

As Air University reworked Field Manual 100-20 and began to draft an Air Force doctrine manual, "The Commander's Guide," in April 1948, the Air Force Publications Board rejected their work outright. Colonel Richard H. Carmichael from the Air War College Evaluation Division, subsequently learned the Air University was no longer responsible for air power doctrine. In fact, via an Air Force Regulation of 26 April 1948, Air Staff agencies were made responsible for manuals on doctrine.³² Intermittently, the Air Staff tasked the Air University to accomplish doctrine projects of rewriting manuals and drafting publications. Also in early 1952, a committee of two Air Staff officers and three Air University officers assembled at Maxwell Air Force Base to develop operational doctrine manuals.³³ By the end of 1952, the committee completed four manuals for Air Staff consideration.³⁴

On 1 January 1953, Lieutenant General Idwal H. Edwards, Commander of Air University, went to Washington and complained that lack of an approved basic doctrine manual hampered Air University's mission accomplishment. Consequently, the Air Force Director of Plans received direction to turn out the basic doctrine manual as a number one priority.³⁵

The Air Force Directorate of Plans reorganized to develop an Air Policy Branch for doctrine tasks. Under further internal reorganizations on 15 July 1958, the Air Force Directorate of Plans established the Air Doctrine Branch. The Air Doctrine Branch was the single point of reference for review of basic air power doctrine prepared by the Air University, and for operational doctrine prepared by the major air commands. Following the Defense Reorganization Act of 1958, on 1 December that year, the Air Force Directorate of Plans recommended the Air Doctrine Branch be given all air power doctrine responsibility.³⁶ After lengthy Air Staff debates, this concept was approved on 6 March 1959.³⁷

Following an Air Staff reorganization of 1 July 1961, the Office of the Deputy Chief of Staff for Plans and Programs established an Aerospace Doctrine Division, under the Deputy Director of Plans for Aerospace Plans.³⁸ This division produced several consecutive updates of Air Force Manual 1-1, their latest in 1984. Shortly after publication, they began another rewrite. When this revision reached General John L. Piotrowski, Vice Chief of Staff of the Air Force, he raised several questions and recommended the project be shelved.³⁹

A new twist to doctrine writing began in 1987. Early that year, Lieutenant General Harley Hughes, Deputy Chief of Staff, Plans and Operations, resurrected the doctrine division's earlier shelved rewrite for

further action. Meanwhile in the summer of 1987, CADRE requested Lieutenant General Hughes' permission to develop Air Force Manual 1-1. After the Air Staff denied CADRE's request, Lieutenant General Truman Spangrud, Air University Commander, convinced General Larry D. Welch, Air Force Chief of Staff, to allow CADRE to write this doctrine manual. Eventually in 1988, Lieutenant General Jimmie V. Adams, Deputy Chief of Staff, Plans and Operations, directed his division to drop their revision efforts.⁴⁰

Where We Are Today

There are many organizations addressing doctrinal problems, but how many of them have perfected adequate procedures to ensure that the doctrines produced represent only the most refined distillates from experience?⁴¹

Where are we today? We have joint doctrine, combined doctrine, basic doctrine, operational doctrine, and tactical doctrine, to name just a few. Air Force Manual 1-1 states that all airmen should be knowledgeable and articulate in air power doctrine.⁴² Where is the connection between all these doctrine efforts and this Air Force Manual 1-1 direction? Today, the official responsibility for air power doctrine resides at the Air Staff. However, as the historical perspective of doctrine responsibility highlighted, even though one particular office is tasked, doctrinal inputs and assignments do not always come from that office. For the current perspective, one needs to examine the Doctrine and Concepts Division of the Directorate of Plans (USAF/XOX), that has the specific air power doctrine responsibility, and the Airpower Doctrine Division of the Center for Aerospace Doctrine, Research, and Education (AU/CADRE), for they have a very intriguing role in the future of air power doctrine development.

Air Force Regulation 1-2, *Assignment of Responsibilities for Development of Aerospace Doctrine*, clearly delineates the management and responsibilities within the Air Force:

The Directorate of Plans (HQ USAF/XOX) is responsible for the overall policy, control, development, direction, and management of Air Force doctrine. HQ USAF/XOX is the single point of contact for the development of all Air Force doctrine to include the Air Force contribution to joint and combined doctrine. (The Air Force Doctrine and Concepts Division is USAF/XOXWD.)⁴³

To look at the Doctrine and Concepts Division accurately, their exact responsibilities must be reviewed. Although they are assigned many functions, the following are their Air Staff Office of Primary Responsibility (OPR) doctrine-related taskings:

- (1) Act as focal point (FP) for Air Force Doctrine Program.
- (2) Develops, coordinates, publishes, and disseminates Air Force doctrine.
- (3) Manages, coordinates, and directs the development of Air Force Operational doctrine to insure consistency with Air Force basic doctrine and Department of Defense joint doctrine, as well as combined doctrine.
- (4) Develops the Air Force contribution to joint and combined doctrine.
- (5) Provides doctrinal basis for and doctrinal review of Directorate planning documents.⁴⁴

Additionally, for the Directorate, this Division is:

The focal point for the Air University's Airpower Research Institute (ARI), a division of Air University/CADRE.⁴⁵

But what does all this mean to a layman? The Air Force Doctrine and Concepts Division is located in the Pentagon with ten people assigned. The desire is that each individual will have either a masters or doctorate degree in Military History. As the past often focuses our view to the future, air power doctrine responsibility is mirroring the 1950s. The Air Force Doctrine and Concepts Division no longer originates doctrine.⁴⁶ In

fact, while still officially tasked for all Air Force doctrine, they adamantly feel CADRE must coordinate their doctrine rewrite efforts with them. As such, the Doctrine and Concepts Division will coordinate with all commands and agencies for comment on both initial and final drafts, while tasking CADRE with update efforts.⁴⁷ Summarily, they serve as a tasking agency to assign doctrine writing responsibilities, while they act as a filter, facilitator, and coordinator.⁴⁸

What then, is CADRE's official role? According to Air Force Regulation 1-2, "Air University, through the Air University Center for Doctrine, Research, and Education (AU/CADRE) provides advice, assistance, and research support for HQ USAF/XOX doctrinal development efforts, as required."⁴⁹ The Air University catalogue expands on this: "AU/CADRE carries on the traditions of the Air Corps Tactical School where, in the 1930s, future leaders of the US Air Force were trained and the basic doctrine and concepts of US air power were formulated."⁵⁰ CADRE is further subdivided to include the Airpower Research Institute. Their primary objectives include:

Conduct in-depth studies relating to air power employment concepts of doctrine, strategy, and technology; technical, politico-economic, and military trends that can contribute to the long-range planning efforts of the Air Force; and challenges to military professionalism in a changing environment.⁵¹

And finally, the Airpower Doctrine Division of the Airpower Research Institute:

Personnel in this division concentrate on the most effective employment of aerospace power in the joint and combined arena by assessing aerospace doctrines and formulating concepts related to basic and operational aerospace doctrine. This activity encompasses the entire spectrum of war and all Air Force functions. Research is conducted in all areas of air doctrine, including foreign and joint doctrines, as well as in the nature of warfare and military

strategy.⁵²

The Airpower Doctrine Division, located at the Air University on Maxwell Air Force Base, Alabama, has nine people assigned, eight military officers and one civilian. This manning leaves three positions unfilled, one military officer and two civilian slots. Seven of the nine assigned have advanced degrees.⁵³ Today, they are writing air power doctrine.⁵⁴

The Air Force Chief of Staff directed the Airpower Research Institute to research, write, and publish a "documented doctrine."⁵⁵ Designed as a doctrine manual with two volumes, the Airpower Research Institute completed the first draft of this project on 30 January 1990. The first of the two volumes is a quick reference guide, a little over 13 pages long, that contains an outline of basic air power doctrine. While the second volume is 27 pages long, it provides a series of documented essays to explain the evidence and logic behind each tenet in the first volume.⁵⁶ This draft manual is currently at Air University Headquarters awaiting coordination, prior to submission to the Air Staff for approval.

Where We Should Be

It is probable that new interpretations will continue to be needed if Air Force doctrine is to be responsive to changing national policy requirements, the potential military threat, and developments in military technology.⁵⁷

As the history of air power doctrine responsibility shows, its development was a series of fragmented efforts. While understanding that doctrine serves as the "life blood" for air power employment, a decisive commitment must be made by the Air Force to determine where its responsibility should be. As General LeMay noted in the quote above, air power doctrine must be responsive to (1) changing national policy

requirements such as space operations; (2) the potential threat such as the changes in the Warsaw Pact countries, and (3) to the developments in technologies such as carbon-carbon composites, thermoplastics, and systems like the National Aerospace Plane (NASP). In order to keep pace, the "right" organization, at the "right" location, staffed with the "right" people must be chosen. The Air Force must continue to develop air power doctrine for it is fundamental in achieving the United States' strategy and success in the art of warfare.

With this as a premise, the bottom line question becomes, where should doctrine be developed? As the past amply demonstrated, the Air Force never found the "right" organization, the "right" people, and the "right" location permanently.

Turning first to the "right" people, Mitchell and LeMay were certainly the "right" people in their time with their far-reaching thinking and foresight. For today's doctrine development, specific qualities and capabilities in people are necessary. As Chapter I explained that doctrine is founded on history and experience, its writers therefore need an extensive broad knowledge in military history, national policies, technologies, other service's doctrines, and the threats to national security. Furthermore, they need a vast understanding of the Air Force and where it is going. They need to interface with all the commands of the Air Force. Also, they need access to general officers past and present to garner knowledge from their experience close proximity to Air Force professional military education schools, and the ability to develop, evaluate, and distribute basic concepts and ideas of air power.

For these "right" people to function effectively, they must be in

the "right" organization. The organization should not only be free from a daily deluge of staff work, but it should receive the backing and authority from the Chief of Staff of the Air Force. There should be freedom for this organization to espouse Air Force doctrine without the threat of repercussions or the threat of budget justifications for doctrine. Furthermore, they should use a well-developed process of doctrine development as discussed in Chapter II.

Finally, the "right" people in the "right" organization require the "right" location. The "right" location implies a place to refine, test, evaluate, and distribute air power doctrine. At this location there must be an adequate research library and computer simulation facilities. Furthermore, it must be the place to experiment with doctrinal concepts and ideas.

The United States Army has very effectively founded their doctrine responsibility. They established the US Army Training and Doctrine Command (TRADOC) at Fort Monroe, Virginia. An army four-star general commands TRADOC. What does TRADOC do?

TRADOC manages all institutional training for officers from the basic officer courses through the Command and General Staff College, and for enlisted personnel from basic training through the Sergeants Major Academy. TRADOC commands the Army's service schools and manages officer procurement through the Reserve Officer Training Corps (ROTC) and the Officer Candidate School (OCS). *Doctrinal* and material requirements are developed by the service schools and are coordinated through three integrating centers--the Combined Arms Center at Fort Leavenworth, Kansas; the Soldier Support Center at Fort Benjamin Harrison, Indiana; and the Logistics Center at Fort Lee, Virginia, all under the command of TRADOC. Additionally, TRADOC supports Total Army training by developing, producing, and distributing training support materials to commanders in the field. In accomplishing these missions, TRADOC conducts extensive coordination with AMC, FORSCOM, sister services of the Navy, Air Force, and Marine Corps, and representatives of allied armies. TRADOC also operates a worldwide network of liaison officers to maintain effective communication with Army operational forces as well as those of the sister services and

allies.⁵⁸

TRADOC, then, is intimately involved in developing army doctrine, training the soldiers who will implement the doctrine, and developing the requirements for the weapon systems the Army soldiers need to carry out the doctrine.⁵⁹ The army for their purposes found the "right" people, organization, and location.

Even the Soviets developed their doctrinal responsibility, over time--the Soviet General Staff. They are their one organization to develop, define, and improve Soviet military doctrine.⁶⁰ A Soviet officer defined the General Staff's role:

...questions of organization, training, and employment of the armed forces in war, determining the major trends for combat employment, the technical equipping, and the organizational structure of the armed forces; the development of military art, and the requirements for the combat training of troops and their combat readiness.⁶¹

Marshal Viktor Kulikov, Chief of the General Staff from 1971-1977, further defined the General Staff's role:

The General Staff comprehensively analyzes and evaluates the developing military-political situation, determines the trends in the development of the means of waging war and the methods of their application, organizes the training of the Armed Forces, and ensures their high combat readiness to repel any aggression.⁶²

Since 1977, the Chief of the General Staff has been second in military protocol, ranking behind the Minister of Defense.⁶³ The General Staff is organized along functional lines. The most important directorate, the Main Operations Directorate, has the broad primary doctrine responsibility. They have a virtual monopoly over all aspects of Soviet doctrine, as it directly relates to their combined arms approach. This function is clearly at the highest levels in the Soviet Union.⁶⁴

Recommendations

So where should we be? Today, the Air Force faces many doctrine challenges, not the least of which is where to assign air power doctrine responsibility. The importance of doctrine is unquestionable, as all airmen are required to be knowledgeable and articulate in it according to Air Force Manual 1-1, *Basic Air Force Doctrine of the United States Air Force*. Whoever is responsible for doctrine development must be aggressive--for doctrine is the "life blood" of the Air Force. Doctrine developers must be farsighted, like the Air Corps Tactical School instructors in the 1930s. Summarily:

Doctrine must function in the present, be appropriate for the near-future, possess flexibility and adaptability to meet changing conditions, and be rooted in the past, in military history and experience.*

To do so, the Air Force needs to begin by assigning doctrine to the correct level of responsibility. The Soviets have a General Staff, headed by a Marshal, the United States Army has a major command, TRADOC, commanded by a four-star general--the essence of doctrine is institutionalized by these arrangements. If the Air Force is serious, they need to place doctrine responsibility at a similar level, not a two-star level in the Pentagon sublet to a five-letter Air Staff office, but rather a four-star general officer.

Secondly, the "right" people need to personally work doctrine. It takes three types of individuals: those who understand military history, those who know military systems, and those who represent each major air command. They should work together as a closely knit team or organization, with no group dominating the other. They need a system to write, discuss,

and communicate doctrinal concepts via Air Force journals. They need to evaluate doctrine at the Air Force professional military schools and be able to test doctrine concepts on computer simulators.

The Air University at Maxwell Air Force Base, Alabama, clearly fulfills the role as the "right" location. First, make the Air University Commander responsible for air power doctrine. His facilities and resources are top-notch, the best the Air Force has to offer. Together, Air University's Fairchild Library and the Air Force Historical Research Center combine to provide extensive research facilities with over a million military documents, books, bound periodicals, and maps. CADRE's Wargaming Center is capable of conducting simulated wargames and computer simulations for development, testing, and analysis. Furthermore, the Air Force professional military schools of Squadron Officer School, Air Command and Staff College, and Air War College provide a ready resource of the service's finest officers to brainstorm, test, and evaluate theories of air power doctrine. Additionally, numerous active duty and retired general officers, Congressmen, and distinguished speakers attend forums, symposiums, and flag officer courses, and speak to professional military education classes to update national policy nuances, measured against a depth of experience and unique perspectives, at Maxwell Air Force Base. The wealth of experience contained in the multi-service military course instructors, civilian academicians, and assorted staffs can be tapped for doctrine projects of any imagination. And finally, the *Airpower Journal*, a forum to promulgate doctrine concepts to the service audience, is part of the Air University.

The Airpower Doctrine Division of the Airpower Research Institute

at the Air University fits the role of the "right" organization. They are free of daily staff work and have ready access to all the superb Air University facilities and resources. Their mission statement doesn't need much changing. Two items are required: the authority invested from the Chief of Staff of the Air Force through the Air University Commander giving them responsibility needs to be articulated and sufficient numbers of the "right" people need to be assigned.

The "right" people for the Airpower Doctrine Division should constitute a "doctrine corps" in and of themselves. Retired government members, civilian academicians, and active duty military officers should comprise this corps. Military members should be identified at the 10-year point in their career, a few from each major air command, and monitored by an appropriate Air Force Speciality Code (AFSC). They should be the commands' operational experts. The civilian academicians should have doctorate degrees in appropriate areas to include military history and international politics. Retired service members can come from military or government duty backgrounds. The operative concept is to develop a premier doctrine "think tank."

Doctrine is constantly evolving--the importance can not be stressed too much. For as Dr. R. P. Hallion said at the Air Force Doctrinal Conference at Hurlburt Field, Florida, on 5 March 1987:

In this environment, doctrine is more than a theoretical luxury of value only in the classroom. It must be the binder, the adhesive, *justifying* our future technological research and development, *rationalizing* our planned acquisition strategy, and *governing* our present employment of forces....But it is a challenge that must be faced, for at no time in the previous 40 years of Air Force history has the service faced such a range and complexity of possible futures.⁶⁶

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CHAPTER IV

AIR FORCE DOCTRINE IMPLEMENTATION - ORGANIZING,

TRAINING, EQUIPPING and SUSTAINING

by Lt Col Richard H. Zeimet, USAF

Introduction

The Air Force shall be organized, trained and equipped primarily for prompt and sustained offensive and defensive air operations.¹

Air Force Manual (AFM) 1-1, *Basic Doctrine of the United States Air Force*, notes that doctrine is written at three different levels, basic, operational, and tactical, each playing an important role in describing and guiding the preparation and employment of aerospace forces.

Basic doctrine states the most fundamental beliefs which provide broad guidance on how Air Force forces are prepared and employed. Air Force basic doctrine is published in 1-X series manuals.

Operational doctrine applies the principles of basic doctrine to distinct objectives, force capabilities, and broad mission areas. Air Force operational doctrine is published in 2-X series manuals to provide detailed descriptions and methods for preparing and employing aerospace forces.

Tactical doctrine, the third level of doctrine, applies basic and operational doctrine by describing the proper use of specific weapon systems to accomplish detailed objectives. Tactical doctrine is published in 3-X series manuals.

The question this chapter will investigate is whether Air Force basic doctrine does in fact drive how the Air Force prepares its forces. To answer this question we will look at the basic doctrine implementation functions of organizing, training, equipping and sustaining, in turn. We will first describe what basic doctrine states about each function, then trace each function through to actual practice to analyze whether current day Air Force activity evidences basic doctrine implementation. We will not attempt to extend this analysis to the other levels of doctrine except to note how they support basic doctrine, nor attempt to assess whether the employment concepts of Air Force basic doctrine are flawed.

Background

The preface to AFM 1-1, Air Force basic doctrine, states:

Aerospace doctrine is a statement of officially sanctioned beliefs and warfighting principles which describe and guide the use of aerospace forces in military action. The Air Force promulgates and teaches this doctrine as a common frame of reference on the best way to prepare and employ aerospace forces. Additionally, aerospace doctrine drives how the Air Force organizes, trains, equips and sustains its forces.²

The concept that doctrine should be used as a guide for organizing, training, equipping and sustaining has not always been accepted by all Air Force leaders as one of doctrine's roles. Although the Air University espoused this concept in the early 1950's, some senior Air Force officers were far more skeptical of using doctrine in this role.³ The Air Force "...is not bound to any fixed doctrine or concept. It grew out of scientific achievement.", noted General Nathan Twining, Acting Air Force Chief of Staff in 1952.⁴ General Hoyt S. Vandenberg warned that the tremendous changes in new weapons as a result of technological development required periodic extensive review and update of doctrine, implying that

doctrine was too changeable to use as the basis for shaping forces.⁵ General Lawrence S. Kuter noted that when looking backward he could not see where doctrine had ever been a controlling factor in setting the rate of development of air power. He recognized the mutual interdependence of technological, doctrinal, political and other elements.⁶ However, General Kuter did note that in order to prepare for a future war the Air Force would have to have "proper doctrine" since in "jet age atomic warfare" there would be little time to correct mistakes in the types of forces provided or in their organization or training. Only proper, accepted doctrine would ensure future preparedness.⁷ Finally, in the 1950's, there was a belief that written doctrine had failed to provide useful guidelines for the future development of the Air Force. This resulted in a general sentiment among research and development officers that the Air Force should abandon its attempts to develop doctrine and seek a broader field of military science with the objective of producing models or theoretical projections of military concepts and principles of military influence.⁸

Early versions of Air Force basic doctrine, while outlining the basic missions and principles of air power employment, did not specifically address the use of doctrine to help drive the organization, training, and equipping of the Air Force. Though the early Air Force leaders did understand this role of doctrine, it wasn't until the 1979 version of AFM 1-1 that these various implementing functions were all formally addressed as a part of basic doctrine.

Because basic doctrine deals with broad basic fundamental principles, we expect these basic principles to be relatively stable. As a result, we then expect the evolution of doctrine to proceed in a slow

steady manner, without large, sudden changes. That is, the effect that time, experience, and technological development have on these basic beliefs should be relatively minor. Unfortunately, when reviewing the history of the development of Air Force doctrine, stability does not seem to be one of its virtues.

The 1920's and 1930's and on into World War II, marks the period in air power's history when basic air power doctrine was first being theorized and articulated. Prior to this period, air power doctrine did not exist. As General I.B. Holley Jr. notes, the the experience of the United States in World War I left the Air Service planners in precisely the same situation they were in upon entering the war; without a clearly defined doctrine on aerial warfare.⁹ General Hansel also notes that to his knowledge, the Army Air Corps had no official body of doctrine in the early 1930s.¹⁰ It was during this period of time the great pioneers of air power such as Douhet, Trenchard, and Mitchell, etc., were first articulating the basic foundations upon which airpower doctrine would be based. Within the Army Air Corps this work would be added to as the Air Corps Tactical School taught and tested air power doctrine.

As this doctrine was first being developed and refined, it was prone to tremendous changes in the fundamental beliefs it espoused as experience either validated or invalidated the current doctrinal thinking. The pre-World War II doctrine of precision daylight strategic bombardment stressing the use of unescorted heavy bombers is just one example of how this infant untested air power doctrine evolved. When the experiences of World War II invalidated the concept of the invulnerability of heavy bombers to fighter attack this espoused doctrine was modified to endorse

the need for fighter escort.

World War II also saw the first large scale use of tactical fighters in both air interdiction and close air support roles. The doctrine on the employment of air forces in these roles was basically developed and proven as the war was being fought. The tactical fighter organization and employment principles used both during and after the Operation Overlord landings on Normandy Beach differed significantly from that used in support of the Allied landings and campaign in North Africa.

Thus the doctrine describing the use of air forces, both strategic and tactical, that emerged from the war was significantly different from that being expressed prior to World War II. However, the role doctrine plays in the organization, training, and equipping of air forces has not changed.

The Relationship Between Doctrine and Its Implementation Functions

The relationship each of the basic implementation functions has with doctrine varies with each function.

Organization

In the case of the organizing function, the relationship should be strictly one way. That is, doctrine should provide the basis for and thus drive the organization of the forces being employed. Organization should never be a determinant of doctrine.

One example of the problem that can arise when organization drives doctrine is the use of tactical fighters in support of ground operations in North Africa. The lack of a clearly stated air-to-ground employment doctrine entering the war did not allow the organization and relationship

between ground and air forces to be proven before entering combat.¹¹ As a result, the fighters supporting ground forces were placed under the command of the army formation commanders. This organizational arrangement resulted in the existence of organic air power in each army unit much as each unit would have its own organic artillery or armour. This organizational arrangement also drove the employment doctrine which caused the piecemeal, ineffective use of tactical air power during the campaign. It was only after analyzing the failure of the XII Air Support Command to provide adequate tactical air support that it was recognized that tactical air must be organized differently than artillery or armour. Centralized command and control of air power under a separate Air Commander now became the doctrine for organization. This new organizational arrangement was immediately incorporated in the War Department Field Manual 100-20 published in 1943 and implemented. The manual stated that the inherent flexibility of air power could only be effectively exploited by centralized command and control through the Air Forces Commander.¹² This new organizational arrangement was then proven during the Normandy Invasion and the following ground operations in France and Germany.

Training

Although the training function should be primarily driven by doctrine, that is, it should be the tool for instilling doctrine into the day-to-day operations of the forces being employed, training is also a legitimate avenue for both validating doctrine and providing input to its evolution. Since doctrine is both based primarily upon experience and relies upon experience to either prove or identify changes, training, the only means of 'employing' doctrine in peacetime, must provide this

experience. As Colonel Dennis Drew has noted, airpower, unlike land and sea forces with centuries of experience to rely upon, has a very limited wartime experience base to establish and validate its doctrine.¹³ Thus, the role that training plays in the development and proving of airpower doctrine is even more crucial than for land or sea power doctrine. However, for the training function to operate in this manner the leaders must be willing to critically review events and accept that doctrine may be called into question and shown to be obsolete or invalid.

In another example, an umpire overseeing full scale Army tank maneuvers in 1940 criticized Gen George S. Patton when he failed to mass his tanks according to the book. General Patton did so because he was developing and testing a new tank doctrine which avoided frontal assaults in favor of sweeping end runs to get to the enemy's rear lines of communication.¹⁴ The dogmatic position taken by the umpire is exactly the position not to take when judging doctrine via training maneuvers. Departures from current doctrine that do or do not work provide the varied experience base needed to critically review the validity of that doctrine.

Closer to home, the Army Air Corps Tactical School's doctrine on strategic bombing stressed high speed versus defensive armament as the primary defense against pursuit attack. To test their theory that speed would even prevent frontal attacks by pursuit aircraft from succeeding, they staged a trial test between a Curtis P-36 flying at 300 mph on a collision course with a Martin B-10 flying at 200 mph. As General Holley notes, the fighter pilot who said he barely had enough time to identify much less attack the bomber from this frontal assault must have been

fainthearted. During World War II, Luftwaffe pilots vigorously and successfully pressed home such attacks while flying higher speed fighters against faster B-17 bombers. However, based on this questionable test the Tactical School continued to hold to the doctrine of speed as providing a measure of invulnerability for heavy bomber aircraft.¹⁵ The problem of accepting the proving or disproving of doctrine in training is difficult when the results are not critically reviewed.

Equipping and Sustaining

The implementation function of equipping and sustaining aerospace forces, like training, requires a strong two way relationship with basic doctrine. As AFM 1-1 notes, the development of emerging technology may well influence the development of doctrine, but the procurement of weapons systems must primarily provide the capability to execute current doctrine.¹⁶ Doctrine must recognize the capability of the weapons being provided in order to fully exploit this capability.

As General Holley notes, forces in the past have been slow in applying the maxim that superior arms favor victory. This intransigence according to General Holley has resulted from three shortcomings; failure to adopt the thesis that superior arms (quality over quantity) favor victory; failure to establish doctrine regarding the employment of new weapons; and failure to devise techniques for identifying and evaluating potential weapons resulting from technological advance.¹⁷

Additionally, doctrine must be forward looking enough to help guide the direction industry and research should take in the development of new weapons technology. For example, efforts to develop breach loading firearms were undertaken as early as 1840. However, the Army Ordnance

Department only half heartedly supported this development. They were so firmly convinced of the superiority of muzzle loading firearms in combat that they did not see the need to push development of breach loaders. nor did Army doctrine provide any guidance or direction in this development. It was not until 1864 that the first field tests of breach loading repeating rifles proved their overall superiority in terms of both offensive and defensive firepower, too late to substantially change the course of the Civil War.¹⁸

General Holley also notes that weapons superiority stems not only from the selection of ideas for technological exploitation, but also from a system which relates ideas selected with doctrine. New weapons, when not accompanied by doctrine are just so many external accretions on the body of an army.¹⁹ During World War I the elementary doctrine of aerial warfare imposed few difficulties in developing and acquiring aircraft for either observation or pursuit since the concept of both military functions were universally understood and accepted. However, in the case of bombardment, doctrine was clearly lacking and uncertain with a corresponding overwhelming influence on the production of bombers, rendering the military organization for supplying bombers totally deficient.²⁰

Summary

In all three implementing functions, having clear, well defined doctrine significantly enhances the ability to carry out each function effectively. As the above examples show, the lack of doctrine can result in; ineffective organizations which inefficiently employ the weapons and forces assigned; training that emphasizes tactics and concepts out of date

and ineffective; and the expenditure of limited resources on equipment ill designed and inappropriate to the military tasks required to be performed. Thus, doctrine should play a important role in the Air Force's organizing, training, equipping and sustaining activities.

Air Force Organization Policy
and Basic Doctrine

The most fundamental belief espoused by Air Force basic doctrine since it was first published in 1953 as Air Force Manual (AFM) 1-2 deals with the organization of its forces. AFM 1-2 stated:

Military forces with missions limited in scope to those of a theater of operation should operate in a command system within the theater organization which is designed to utilize most effectively the full capabilities of the forces concerned; whereas, those forces whose mission of capabilities transcend the responsibilities and boundries of any one theater commander should be under the control direction of appropriate higher authority. Assignment of control of forces at any level other than that which is able to exploit fully their weapons is contrary to accepted military doctrine. The effective utilization of military forces requires that command systems be established which will guarantee both centralized overall direction and decentralized control of operations under appropriate subordinate commanders.²¹

The key to Air Force organization doctrine, according to the first statement of basic doctrine, is the concept of centralized control (centralized overall direction) coupled with decentralized execution (decentralized control of operations).

The current version of Air Force basic doctrine, AFM 1-1, continues this fundamental belief in organization. AFM 1-1 states:

Centralized control is essential to positive control of aerospace power. Centralized control is established under a single air commander who directs the employment of forces at a level of command from which the overall air situation can best be judged. This level of authority and responsibility rests with the commander in chief in specified commands and the air component commander in unified or combined commands. Under this concept forces are appropriately executed at the most effective level.²²

As AFM 1-1 further notes this concept is part and parcel of the

principle of war known as Unity of Command:

Unity of command, combined with common doctrine, obtains unity of effort by the coordinated action of all forces toward a common goal. While coordination may be obtained by cooperation, it is best achieved by giving a single commander full authority...To take full advantage of these qualities, aerospace forces are employed as an entity through the leadership of an air commander. The air commander orchestrates the overall air effort to achieve stated objectives.²³

Finally, AFM 1-1 states:

To function effectively in war, organizations, procedures, and channels of communication must be exercised in peacetime on a daily basis...Commanders must organize and exercise forces as they intend to fight.²⁴

The United States Air Force, to include the Air National Guard and the Air Force Reserve, is organized in accordance with the above noted concepts. The Air Force is organized into major air commands (MAJCOMs) based on strategic, tactical, and mobility operations and the functional support of these operations. The MAJCOMs are further subdivided into operating units, e.g., numbered air forces (NAFs), air divisions, wings, groups, squadrons, etc., as required.²⁵

Organizational Policy and Guidance

The Air Force's basic doctrine on organization is implemented through Air Force Regulation (AFR) 26-2, *Organization Policy and Guidance*. As AFR 26-2 notes, the Air Force is organized to provide operationally ready forces to the combatant commands. In order to do this the Air Force relies on the following principles to organize its forces: functional grouping, unity of command, span of control, delegation of authority, and decision making requirements.²⁶

Functional Grouping. The first principle in establishing Air Force organizations, functional grouping, requires that each part of an organization be directed by a major goal, constitute a logical, separable

field of responsibility, and have a clear cut charter definite in scope with a single commander or supervisor in charge. Further, AFR 26-2 notes that functional grouping should be combined into organizations that provide efficient administration and command control.²⁷ The concept of functional grouping is employed at all levels of organization from the designation of a MAJCOM to the smallest work center in a unit. Each Air Force MAJCOM represents the logical functional grouping to meet a clearly defined charter.

Unity of Command. This principle holds that each person's responsibilities be clearly defined, each person be held accountable to only one superior for performing specific responsibilities, and conversely, responsibility for each task be clearly assigned to only one person.²⁸ This means clear lines of authority must be established, and overlapping responsibilities eliminated.

Span of Control. This concept recognizes that there is a limit to how many people one person can effectively control. Span of control is not based on any fixed formula, but is dependent on such variable factors as the complexity of the mission, distance from subordinates, level of supervision required, etc.²⁹

Delegation of Authority. This principle holds that each commander should exercise the most responsibility practical at that level. Delegation of authority is designed to help streamline organizational structure and results in decentralized versus centralized execution.³⁰

Decisionmaking Requirements. This principle states that an organization should be structured to permit rapid decisionmaking. Thus intermediate levels of organization, usually established to reduce span of

control, must have clear responsibilities and commensurate authority.³¹

Objectives of Air Force Organizational Policy

The primary objective of Air Force organizational policy is to organize in peace to allow quick transition to war by avoiding organizational turbulence and maintain a structure that operates effectively with the least expenditure of resources. In other words, efficient organizational structures are the goal, but not at the expense of wartime effectiveness. All Air Force organizations are designed with the primary emphasis of the capability to accomplish wartime tasks without the need for further reorganization.³² Secondary objectives include keeping pace with technological advances, changing missions and concepts of operation (operational and tactical doctrine), and streamlining decisionmaking.

A cursory review of the current Air Force MAJCOM and Special Operating Agency/Direct Reporting Unit (SOA/DRU) structure reveals that the Air Force is apparently logically organized based upon a division of basic doctrine missions and specialized tasks and their support. However, a quick look at the history of the Air Force's organizational efforts is needed to see if this current condition is the result of applied basic doctrine or happenstance.

Doctrine and Early Air Force Organization

The National Security Act of 1947 charged the Air Force to organize, train, and equip air forces for air operations to include: air superiority; strategic air force; strategic reconnaissance; airlift and support of airborne operations; air support of land and naval forces; and air transport for the armed forces except as provided by the Navy for its

own use. This act combined with the Key West agreements of 1948 established the basic missions and functions around which the Air Force organized.³³

The Army Air Force's (and the soon to be independent Air Force) post-World War II organization, however, was based largely on the wishes of General Eisenhower, the Army Chief of Staff and General Spaatz, who was serving as the Commanding General, Army Air Forces. Between them, they agreed the major commands of the Army Air Force should be the Strategic Air Command, the Tactical Air Command, the Air Defense Command, the Air Training Command, the Air Technical Service (Air Material Command), the Air University, the Air Force Center, and the Air Transport Command.³⁴

This command arrangement was not static. The Air Force soon saw a need for greater emphasis on research and development and established the Air Research and Development Command in 1950.³⁵ The Tactical Air Command and Air Defense Command were soon reduced in importance and placed under a newly formed Continental Air Command, because of the perceived need to place all tactical fighter operations under one command. However, the Korean War, the Army's perception that this move reduced the support provided to the Army, and the recognition that it would be very hard to develop one fighter to perform both strategic intercept and close air support functions, resulted in the Tactical Air Command being reestablished.³⁶

Thus, as a special Air University study group of this period noted, we see the Air Force being organized "...as a result of ideas existing in the minds of a very few men." versus the on the basis of sanctioned and approved doctrine.³⁷ If doctrine was involved, it was what

Colonel Drew has termed 'informal doctrine' which he defines as the result of repeated experiences that produce beliefs, sometimes personal, sometimes broadly held, about what usually works best versus formal Air Force doctrine.³⁸ Even during the changes that resulted when the Department of Defense reorganized in 1958 the Air Force, according to Furtrell, appeared to rely more on assumptions of future trends based on the statements of key individuals than formal Air Force doctrine.³⁹

We can conclude from the preceding discussion that formal Air Force basic doctrine did not appear to have a major influence on early Air Force organization efforts. This was due in part because immediately after World War II a separate doctrine for the Air Force had not been formally developed. The first version of officially sanctioned basic doctrine did not appear until 1953. Additionally, as we have noted earlier, not all the early leaders were totally in agreement with the notion that doctrine was useful as a tool for organizing forces. Finally, even during the reorganization efforts in 1958 when official basic doctrine existed, the Air Force seemed to rely more on informal doctrine based on individual beliefs and perceptions than formal doctrine. The question is, are we doing any better today?

Doctrine and Today's Air Force Organization

As AFM 1-1 notes, the National Security Act of 1947 established that the Air Force "...shall be organized, trained, and equipped to perform prompt and sustained offensive and defensive air operations." AFM 1-1 also notes that the Department of Defense Directive 5100.1, *Functions of the Department of Defense and Its Major Components*, along with other policy documents such as the *Defense Guidance*, help to guide

the Air Force in preparing its forces.⁴⁰ In order to carry out these assigned functions, the Air Force, via AFM 1-1, has outlined the various Air Force missions, broad military objectives to be attained by employing aerospace forces, and specialized tasks, functions which enhance the execution and successful completion of Air Force missions.

At the MAJCOM level we see functional grouping of like missions as the basis MAJCOM organization. This overall MAJCOM structure is very similar to that first set up in the early days of the Air Force, and logically fits the basic missions and specialized tasks as outlined in AFM 1-1. The fact this structure was developed with very little doctrinal input as we have previously seen does not mean it is not in agreement with doctrine. However, in recent years the Air Force has seen several major organizational initiatives that have a doctrinal basis.

The first example is the reorganization of the Tactical Air Forces (TAF) maintenance function from a centralized to decentralized maintenance concept. This revised maintenance structure known as Production Oriented Maintenance Organization (POMO) and later called Combat Oriented Maintenance Organization (COMO) has totally revamped the TAF's approach aircraft maintenance.

Under the old aircraft maintenance concept, organized under AFM 66-1, *Maintenance Management*, maintenance was highly centralized with wing level maintenance squadrons. However, the TAF generally deploys in squadron size versus wing size units because of the need to disperse forces and use forward bases often limited in space and facilities. Therefore, under the AFM 66-1 maintenance concept deployments in this manner required the wing to reorganize drawing specialists from the

centralized organizations to form new smaller organizations to support the deployed squadrons.⁴¹ Contrary to basic doctrine, the TAF was not organized as they intended to fight. POMO changed all that.

POMP/COMO abolished this centralized maintenance concept was abolished forming a new maintenance organization around a squadron concept that placing more people on the flightline and assigned to units designated to supporting only one flying squadron. This increase in flightline manning has allowed the cross-utilization of maintenance personnel and led to significant across-the-board increases in aircraft sortie rates.⁴² Additionally, the TAF does not have to reorganized to deploy but can pickup and move at a moments notice with little disruption. Though the POMO/COMO concept is more manpower and equipment intensive the significant increase in combat capability as a result of the greater sortie generation capability of the maintenance organization warrants the use of this "less efficient" organizational concept.⁴³

The second example of doctrine playing a part in Air Force organizational efforts concerns the creation of Space Command in 1982. The birth of this new MAJCOM coincided with the publishing of AFM 1-6, *Military Space Doctrine*, the Air Force's basic doctrine for space operations. AFM 1-6 summarizes our national space policy and the basic principles which govern the Air Force in fulfilling its responsibilities, functions and missions in space.⁴⁴ Using this basic doctrine as its blueprint the Air Force has organized, trained, and equipped Air Force Space Command.⁴⁵

A third example of doctrine in action deals with Strategic Air Command (SAC) aircraft maintenance. SAC has recently initiated a

reorganization of its maintenance functions under a concept similar to the TAF's POMO concept. This concept called Readiness Oriented Logistics System (ROLS) is a program to decentralize in order to increase maintenance flexibility and deployment capability. CINCSAC directed the change in response to the need to generate more sorties and deployable units to meet SAC's growing conventional mission resulting from the evolution of strategic doctrine.⁴⁶

In his analysis of this concept, Major Taylor notes that it brings SAC back to concepts that proved their worth during Korea and Vietnam and is consistent with published doctrine.⁴⁷ The overall result of this change has been the ability to accommodate more sortie taskings increasing SAC's overall mission and combat capability.⁴⁸

Finally, the Air Force is currently rewriting its basic doctrine and in conjunction with this rewrite is conceptualizing new organizational alignments that will better fit this new doctrine. One concept being considered entails units that embody different types of combat aircraft such as long range bombers, ground attack and air superiority fighters, and electronic combat radar attack and radar jamming aircraft in one unit versus segregated single purpose units as they are now organized.⁴⁹ What's important about this endeavour is the fact that doctrine, both current and conceptual, is serving as the basis for this look at new organizational alignments.

Summary

Is basic doctrine playing a role in the organizing activities of the Air Force? We believe the answer is maybe but improving.

AFR 26-2, the Air Force's directive on organizing, details

principles and objectives of organizing consistent with AFM 1-1 basic doctrine. Though early Air Force organization efforts do not appear to be based on formal doctrine, several recent organizing efforts have seemed to strengthen the doctrinal basis of those organizations. Further, the development and publishing of AFM 1-6, *Military Space Doctrine*, concurrently with the formation of Air Force's Space Command demonstrates the intent to use doctrine as the foundation of this new MAJCOM. Finally, the fact that the Air Force is using current and evolving doctrine to conceptualize new organizational structures reflects an emphasis on doctrine that has been lacking in the past.

Air Force Training and

Basic Doctrine

The implementing function of training, unlike organizing, is not wrapped in a fundamental belief of Air Force doctrine, but rather is an understood task of doctrine. By that I mean how one should train is not generally considered a part of basic doctrine. Doctrine in its simplest terms is nothing more than a statement of the most broadly held beliefs of what usually works best when employing a given military force be it land, sea, or air force. Training to employ that force doesn't have to be spelled out in doctrine. It's a natural function or outgrowth of doctrine.

However, our current statement of basic doctrine does address the training function. AFM 1-1 states:

The Air Force has a primary function to train combat and support forces to ensure the conduct of prompt and sustained aerospace combat...Aerospace doctrine gives direction to our training...Sound military judgement and historical experience dictate the importance of educating and training forces in the way they intend to fight. The goal...is to help produce a professional force that is prepared to apply theory and knowledge to the task of fighting and winning wars.⁵⁰

Current Air Force basic doctrine recognizes the importance of training as a means to ensure our forces are ready to fight.

AFM 1-1 further notes:

Realistic training is an important element of that process. To ensure the readiness of our forces, commanders must develop and simulate, as closely as possible, the combat environment in which we expect to fight. This means training in simulated combat situations that impose the operational realities of degraded command, control, and communications; adverse environmental conditions; and intense physical and electronic threats. When we provide this kind of education and training...we maintain the highest level of readiness.⁵¹

What AFM 1-1 is emphasizing by this statement of basic 'training' doctrine is that operational as well as technical competence is required in order to properly prepare air forces for employment. Technical competence, the development of individual skills and proficiency to perform specific individual tasks is important. for without this technical ability our forces would not be able to function at the most basic level. Individual technical competence, however, is not enough. The Air Force must work to ensure this competence is challenged to develop an 'operational' competence as well. This is accomplished by integrating realism into the training scenario to develop warfighting skills versus task skills. That is, imposing the operational realities AFM 1-1 describes will ensure that technical competence is not just a peacetime operating skill but is converted into a true warfighting operational competence.

AFM 1-1, however, does not address the second function of training with respect to doctrine, the function of proving doctrine. As we noted earlier, training and doctrine must maintain a two-way relationship. Training is necessary to impart doctrine and at the same time provides the experience base, in peacetime, with which to judge doctrine.

Doctrine must become an integral part of this training since it

details how to best employ forces. Additionally, as Capt Lawerance S. Kuter noted in 1938 while serving as a member of the Air Corps Tactical School's instructor staff.

Battles have been won too often by the judicious violation of doctrine...Disagree with doctrine in the conference room-be familiar enough with it to violate it in the conference room-but know it well enough to know what it is and why you are violating it.⁵²

The only way to become this familiar with doctrine is to realistically train to employ doctrine and obtaining operational competence versus training to achieve a level of technical competence. In getting this operational competence one will get a chance to see doctrine succeed and fail and, more importantly, will be given the chance to assess why.

Additional Factors Affecting Training

Training differs from the organizing function of doctrine in several important aspects besides its lack of a fundamental basis in doctrine. The type and amount of training given may be limited by outside factors such as regulatory limitations, budget limitations, and overall national strategy.

For instance, in order to reduce accidents and increase overall safety of private, commercial, and military aviation the federal government through the Federal Aviation Administration (FAA) has devised a set of flying rules and restrictions on the operation of civil and military aircraft in the United States. These rules have affected military training and the potential for realism by strictly limiting military training flights to specific restricted areas, limited altitudes and airspeeds that can be used on low level training, etc. While in general these rules do not severely restrict the ability to provide realism in flight training, they do require the Air Force to limit its

training activities.

The second major additional factor affecting training is money. Training costs money and any reduction in the Air Force budget can have an adverse affect on the dollars available to fund training. Any reduction in either flying hours or support for flying hours will limit the amount of training the Air Force can attempt to provide.

Finally, the overall military strategy of the nation may result in more importance being placed on certain aspects of doctrine at the expense of others. This overall emphasis on supporting the national strategy may thus cause training programs to be tailored to the portion of doctrine that best fits this strategy. For instance, our training may emphasis nuclear versus conventional warfare based on an overall national military strategy that places preeminence on nuclear warfare. In this case, placing a secondary emphasis on training in the conventional role is not the fault of doctrine, but rather, the result of national strategy.

Training Policies and Guidance

To analyze current training policy and guidance we will look at several directives addressing aircrew training for tactical fighter, airlift, and strategic bomber forces, and aircraft maintenance training, in order to sample Air Force training policies. These directives, in general, detail the basic policies guiding aircrew, and maintenance upgrade and continuation training.

Within the tactical fighter forces, Multi-Command Manual (MCM) 51-50, *Tactical Aircrew Training*, establishes the minimum standards for training and qualifying aircrew personnel in the various fighter, reconnaissance, and observation aircraft flown by the various TAF MAJCOMs

and serves as the basis for each MAJCOM's training program.

As MCM 51-50 notes, the TAF training concept calls for both MAJCOMs and individual units to design training programs to "achieve the highest degree of combat capability possible" within resource and safety constraints. This training will also be tailored to individual aircrew proficiency and experience.⁵³ Since it is not possible to train aircrews in all possible missions, the TAF has taken an incremental approach to training using Graduated Combat Capability (GCC) levels to outline these training increments.⁵⁴

Under this concept, GCC level A establishes the minimum sortie, weapons qualification events, and ground training events required to qualify an aircrew to perform the units primary Designated Operational Capability (DOC). GCC level B training provides increased proficiency over level A and is used to train some crewmembers in specialized tasks. GCC level C training provides the highest level of proficiency in the basic DOC and complete training in all the tasks assigned against the unit.⁵⁵ Thus, GCC level A is designed to ensure individual aircrew proficiency and develop a minimum level of operational proficiency while GCC levels B and C provide the extra training needed to further develop the operational proficiency of the aircrews.

MCM 51-50 also details several important training policies MAJCOMs and units must follow in designing their training programs. Units should develop mission scenarios based on their location, available training facilities, and employment plans. As MCM 51-50 notes:

Training should emphasize realistic simulated combat profiles and should combine intelligence scenarios briefings, target area penetration, target acquisition and attack, reporting and debriefing. Avoid stereotyping tactics. Aircrew competence in basic skills is the foundation to effective advanced training and must be assured before

advancing to more complex tactical scenarios.⁵⁶

The training should also include the use of live and inert training ordnance, threat simulators, and aircrew training devices.⁵⁷

Within the airlift forces, Military Airlift Command Regulation (MACR) 51-1, *Aircrew Training Program (General)*, provides general aircrew training policy. Unlike the TAF's MCM 51-50, MACR 51-1 does not provide detailed guidance for aircrew training. Instead this regulation simply establishes general guidance and sets forth minimum requirements to maintain flight currency. Initial qualification, mission qualification, continuation training, and upgrade training are published in separate MAC and Air Force 51-X series regulations by aircraft type. However, MACR 51-1 does establish general crew qualification, ground and flight training currency requirements.⁵⁸

Using the C-5 aircraft as an example, MACR 51-5 establishes MAC training standards for transition, qualification, continuation, and upgrade training for MAC assigned C-5 aircrew members.⁵⁹ Again, while this regulation is complete in describing what is needed for individual proficiency it does not appear to address operational proficiency. This is probably because the airlift mission does not vary much between peacetime and wartime operations. Thus, normal day-to-day proficiency training is realistic and doesn't need special effort to add realism for operational proficiency.

Within the strategic forces, we find that each weapon system, both aircraft and missile, has a separate training regulation which, in conjunction with Air Force Regulation (AFR) 60-1, prescribes the basic policy, procedures, and guidance for training SAC crew members in that weapon system. For example, SACR 51-1 provides this guidance for B-1B

assigned units.

SACR 51-1 states:

The Strategic Air Command will develop and maintain training systems that prepare aircrews to perform the operational mission and maintain mission readiness...Training systems are designed to meet precise training objectives, and should be based on developmental standards to ensure the systems are as effective and efficient as possible...The goal of our training system is to train aircrews in the operational tasks, tactics, and warfighting skills needed to perform the mission.⁶⁰

As we can see, operational proficiency, not just individual skill proficiency, is the goal of the B-1B training program. This goal is indicative of all weapon system training in SAC.

Within aircraft maintenance, AFR 66-17, *Maintenance Training Policy*, establishes Air Force aircraft, communication-electronics, munitions, and maintenance training policy. As described this regulation, the objective of maintenance training is to:

...ensure maintenance personnel have the skills and knowledge required to assure Air Force equipment is serviceable, safely operable, and available for sustained use in peace, war and contingencies...Through effective training, the maintenance workforce gains technical knowledge and skills which enhance capability, flexibility, mobility, and survivability.⁶¹

In TAC, Multi-Command Regulation (MCR) 66-5, *Combat Oriented Maintenance Organization*, and TAC Regulation 50-2, *TAC Maintenance Training Program*, outline TAF and TAC maintenance training policies and supplement AFR 66-17. In both regulations the training policies detailed are aimed at ensuring individual technical skill proficiency is attained. Policy guidance for integrating this technical skill into a broader context to provide operational proficiency is not addressed or even alluded to in either regulation.

Though the above examples do not detail all possible Air Force

training programs they are indicative of those specialities closest to the 'battle'. The training policies in these examples vary in their application of basic doctrine's direction on 'realistic' training. The TAF aircrew training directives clearly state that training should emphasize realistic combat profiles in order to achieve the "highest degree of combat capability possible". In the SAC bomber crew training directive this combat realism is strongly implied but never stated. In the MAC airlift training directives combat realism is not even implied. Finally, in the aircraft maintenance training programs sampled, technical competence is the stated goal and operational competence resulting from combat realism is not addressed. Thus, we see basic doctrine's training realism being addressed more by chance than by design.

Doctrine and Early Training Activity

Following World War II, the doctrine of long range strategic bombardment as a means to attack the warfighting industrial strength and the will of the people remained the basis of airpower and thus Air Force doctrine. Additionally, the concept that air superiority was essential to control the air and the importance of tactical air power in supporting the Army were also recognized.⁶²

Even though the first official statement of Air Force basic doctrine, AFM 1-2, wasn't published until 1953, early training activities following World War II attempted to support these basic doctrine concepts. These efforts were soon complicated and in some cases abandoned, however, because of the significant demobilization effort and resulting funding limitations following the war, and the competition among the Services to establish their roles and missions following the 1947 defense reorganization.⁶³

In order to be able to review how the Air Force implemented doctrine through its early training activities we must first review what this doctrine was and more importantly how it changed during the first 15 years of Air Force history.

AFM 1-2, published in 1953, noted there were two broad aspects of air operations. The first was heartland attacks against vital elements of a nation's war sustaining resources, in other words, strategic bombardment. The second was what it termed "peripheral actions" which includes control of the air (air superiority) and support of surface forces in the achievement of their mission (air interdiction and close air support).⁶⁴

What's important to note is the priority AFM 1-2 gave each aspect. AFM 1-2 states:

The conclusive effects obtained by attacks on the heartland targets, which represent the greatest threats, require the priority commitment of air forces to this task...Concurrently, air forces will be committed in peripheral actions designated to neutralize the deployed enemy military forces...There is a cumulative effect on the enemy's ability to wage war when heartland and peripheral actions are undertaken simultaneously. The impact of successful air action directed against the heartland is immediately felt by the nation itself. Its impact on deployed forces, however, may be delayed...Air forces engaged in peripheral actions will, nevertheless, tend to set up additional stresses and strains...⁶⁵

AFM 1-2, in essence, was declaring that strategic bombardment versus tactical support of the Army provided the greatest effect and thus should be considered the priority employment consideration.

When coupled with nuclear weapons, this emphasis on strategic "heartland" attack using nuclear versus conventional warfare strengthened the belief in its primacy. By 1964 the new version of basic doctrine, AFM 1-1, carried the idea of nuclear warfare and thus the primacy of strategic systems to its zenith.

The 1954 version of AFM 1-1 classified war into four categories: general, tactical nuclear, conventional, and counterinsurgency.⁶⁶ AFM 1-1 also noted that in this classification strategic and tactical systems could be used interchangeably to handle strategic and tactical missions.⁶⁷ AFM 1-1 then devoted nine pages describing the employment of forces in either general (six pages) or tactical (three pages) nuclear war while devoting only four pages to conventional (two pages) and counterinsurgency (two pages) operations.⁶⁸ Clearly, the emphasis of basic doctrine was on both general and tactical nuclear war. Because of this emphasis, the strategic bomber forces received first priority in funding during demobilization and thus was able to pursue the goal of training for nuclear war.⁶⁹

In spite of this priority the strategic bomber forces immediately after the war soon lost all operational proficiency because of the lack of realism in their training.⁷⁰ This lack of proficiency was highlighted in late 1948 when General LeMay, the new SAC commander, ordered a maximum effort mission against Wright Field to test SAC's readiness. Though thunderstorms in the area were a factor, not one bomber in the command was able to complete its mission as briefed.⁷¹ Realistic training soon became a way of life in SAC.

In contrast, the tactical fighter forces, under General Quesada's direction, started this period with heavy emphasis on realistic training in support of the Army. General Quesada believed the best way to convince the Army that it didn't need its own tactical air force was to provide the best support possible.⁷² As a result, TAC stressed joint training with the Army.

After the Korean War, however, nuclear forces became the dominant element of US national security policy and Air Force doctrine. This resulted in tactical nuclear versus conventional training becoming the primary focus of tactical training. Tactical training now omitted certain aspects of conventional delivery, instead emphasizing a few basic techniques such as dive bombing and low altitude bombing common to both nuclear and conventional weapons delivery.⁷³ By 1961, the trend in nuclear strike training eventually lead to an almost total abandonment of conventional training. For example, the commander's directive published in the Pacific Air Force's (PACAF) F-100 training manual, PACAFM 51-6, in 1961 said:

Nuclear training will in every instance take precedence over nonnuclear familiarization and qualification. It is emphasized that conventional training will not be accomplished at the expense of the higher priority nuclear training required by this manual. Non-MSF units will restrict conventional familiarization to the accomplishment of only one event per aircrew per year.⁷⁴

Additionally, this stress on the nuclear mission was accompanied by the emphasis of safety at the expense of realistic training, obstructing the development of conventional air-to-ground and air-to-air training.⁷⁵ As a result, when the Vietnam War began, the tactical fighter crews were unprepared to conduct conventional strike operations in the high threat AAA and SAM environment of North Vietnam, or fight maneuvering combat against North Vietnamese MIGs.⁷⁶

In summary, the Air Force trained in accordance with its doctrine of the late 1940s, 1950s and early 1960s. This doctrine evolved from one with almost equal balance between strategic and tactical missions to one stressing the primacy of nuclear warfare, both strategic and tactical, over conventional or limited war operations. As a result, the Air Force

found itself superbly trained in strategic and tactical nuclear operations but ill-prepared for the type of war fought in the 1960s in Vietnam.

Doctrine and Today's Training Activities

Are current Air Force training activities in concert with basic doctrine? As we noted earlier, doctrine should provide the basis for training and according to doctrine should be realistic. In order to assess the role doctrine plays in training we must first define the Air Force's current basic doctrinal beliefs.

Chapter 2 of AFM 1-1 outlines the Air Force's basic beliefs in employing aerospace forces. As AFM 1-1 notes, the premise of this chapter is that the Air Force will both prepare and employ forces according to doctrine.⁷⁷

The first fundamental belief of Air Force basic doctrine concerns control of the air. AFM 1-1 states:

The first consideration in employing forces is gaining and maintaining the freedom of action to conduct operations against the enemy... Aerospace superiority, therefore, is a prerequisite to the success of land and naval forces in battle.⁷⁸

In other words, air superiority is essential to conducting successful attacks and avoiding unacceptable loss.

The second fundamental belief of basic doctrine concerns offensive action against the enemy's warfighting potential. AFM 1-1 states:

Attacking an enemy's warfighting potential includes actions against the will of an enemy and action to deny him the time and space to employ his forces effectively. This involves coordinated attacks against an enemy's warfighting potential not yet engaged and attacks against an enemy's forces in contact... Attack the enemy relentlessly... by persistent and coordinated attacks.⁷⁹

This means aerospace forces must attack in depth both forces in contact (close air support) and forces in reserve or rear echelons (air interdiction). The attacks must be conducted continuously, both day and

night, without regard to weather.

Basic doctrine also states:

While the urgency of enemy actions may require direct attacks against forces in contact, efficient use of air forces should emphasize attack in depth upon those targets that deny the enemy time and space to employ forces effectively. The effort of these attacks is profound when the enemy is engaged in highly mobile, maneuver scheme of operations dependent on urgent resupply of combat reserves and consumables.⁸⁰

Thus, while close air support is important and must be supported, doctrine states that the preferred, most effective means to attack the enemy's ground forces on the battlefield is by air interdiction, especially if they are in battle.

The third fundamental belief of basic doctrine concerns attacks against the enemy's heartland. AFM 1-1 states:

Modern warfare has demonstrated the potential importance of strategic attacks against targets in an enemy's heartland. Attacks against heartland targets can produce benefits beyond the proportion of effort expended and costs involved. For this reason, the air commander must seize every opportunity to execute heartland attacks, but there are many considerations in taking these actions. The attacks may be limited by overriding political concerns, the intensity of enemy defenses, or more pressing needs on the battlefield.⁸¹

AFM 1-1 notes that in the case of strategic heartland attacks air superiority, freedom to conduct effective operations, is gained not by direct application of force, but rather by a combination of factors such as speed, maneuverability, tactics, deception, efforts to dissipate or defer enemy defenses, and weapons characteristics and employment.⁸²

In the tactical fighter world we see widespread evidence of realistic, doctrine oriented training. First, in MCM 51-50 we see the various missions associated with air superiority and support of the Army (air interdiction and close air support) covered by the specific training events each aircrew member must complete in each six month training cycle.

The amount and type of training in the various mission related events differs based on the type of aircraft, but is designed to take advantage of the primary design role of each aircraft.

More importantly, in completing the various air-to-air and air-to-ground training events, tactical realism is continually stressed and flown. The standard, box pattern used in the 1950s, 1960s and early 1970s to develop weapons delivery proficiency on a range equipped with a bullseye type target has been replaced with tactical deliveries using pop-up and other tactical delivery techniques against an array of realistic tactical targets, adding realism to each sortie.

Furthermore, the development of instrumented ranges for both air-to-air and air-to-ground training permitting real time tracking and recording of aircraft as they maneuver against other aircraft and ground target complexes provide an added dimension to training. The ability to playback and critique each mission during the debrief has added immensely in the development of aircrew operational proficiency.⁶³

In addition to realistic individual crew training, the use of large scale exercises such as Red Flag and Green Flag help to further develop operational proficiency in the aircrews. Red Flag, first flown in 1975, is a Tactical Air Command program that rotates TAF flying units as well as SAC and MAC units through a realistic, complex, several weeks long series of composite strikes with mock combat against real world Soviet target arrays.⁶⁴

Green Flag is structured similar to Red Flag, but concentrated on the electronic warfare aspects of combat. Green Flag scenarios permit the specialized wild weasel and other electronic combat aircraft to practice

old and develop new tactics in a realistic training environment.⁶⁵

In addition to training, Red and Green Flag exercises help fulfill the second role of training with respect to doctrine, validation. These large scale realistic training exercises permit aircrews to experiment with new tactical doctrines and tactics by providing the experience basis needed to validate and reinforce the value of current doctrine as well as aid in its evolution.⁶⁶ Additionally, after action reports describing the exercise scenario, force employment concepts tried, and lessons learned are published and distributed providing widespread exposure and availability for other units to study and learn.

Another realistic, operational training program, called Checkered Flag, is a deployment exercise designed to acquaint every TAC assigned unit with their specific wartime operating area and base overseas. These scheduled, periodic deployments allow the aircrews to concentrate on learning all they can about their most likely wartime operating area. This familiarization is designed to ensure that during contingency operations, the unit would arrive ready to fight.⁶⁷

The opening of the Army's National Training Center at Fort Irwin has enabled the Air Force to realistically train with the Army during large scale maneuvers. Exercises which include two Army battalion task forces, their brigade headquarters, and accompanying combat support forces provide some of the most realistic close air support training available today.⁶⁸

The strategic forces, in addition to participating in the above exercises to practice and develop their conventional mission, have recently opened a Strategic Warfare Center to emphasize SAC's commitment to realistic training. The center is designed to provide developmental,

academic, and advanced bomber crew training for FB-111, B-52, and B-1B aircrews. This centralized advanced training facility combines tactics development and advanced aircrew training in one location. The center develops realistic combat scenarios for the aircrews being trained and uses the existing Strategic Training Route Complex and its associated ground threat simulators to replicate various high and low threat environment mission conditions for both strategic nuclear and conventional tactical bomber operations.⁸⁸

While the training for aircrews stresses realism, realistic training for many combat support functions is not as wide spread. As Lt Col William McDaniel Jr. recently noted, Air Force doctrine is almost exclusively aircraft employment oriented expressing a "post launch" mentality that largely assumes away logistics and other combat support functions.⁸⁹ In the case of logistics, realistic training is marginal at best. As Colonel McDaniel states:

Most joint and service exercises begin after deployment and end well before sustainment, becomes an operational constraint. The magnitude and complexity of a major force deployment or sustainment have not been rigorously tested in either a field training exercise (FTX) or command post exercise (CPX).⁹¹

This lack of realistic training for combat support activities was further highlighted during the two week Salty Demo air base survivability exercise held at Spangdahlem Air Base, West Germany, in 1985. This realistic exercise replicated the environment that would be found at an air base after a typical Warsaw Pact attack. Shortcomings in various aspects of base recovery from rapid runway repair to explosive ordinance disposal were highlighted in this exercise.⁹² Many of these shortcomings had never been identified before because of the lack of realistic training

and exercising of these combat support functions in a complex, integrated environment.

The above highlighted lack of combat support stress in basic doctrine was addressed in 1987 with the publishing of AFM 1-10, *Combat Support Doctrine*. This basic doctrine can serve as the foundation for civil engineering, logistics, etc., functional doctrine and thus provide the basis for doctrine based training and realism.²³

SUMMARY

Is basic doctrine playing an active role in Air Force training activities? The answer is a definite yes for the operational training of aircrews, and a qualified maybe for most combat support functions.

The relationship between doctrine and crew training appears to have existed since at least World War II. As we saw, post-World War II doctrine stressed long range strategic bombardment as the primary role of the Air Force, with a secondary emphasis on peripheral actions in support of the Army's ground war. When married with the development of nuclear weapons this basic doctrine continued to evolve until, by 1964, the nuclear strike mission, both strategic and tactical, became preeminent. As a result, we saw both strategic and tactical forces stressing nuclear delivery training at the expense of other more conventional skills. Thus, when the United States entered the war in Vietnam in the mid 1960s we found our conventional forces ill-trained for the type of combat operations the war entailed, resulting in the need for considerable retraining. However, this failing was not because the Air Force was not training to its basic doctrine, but rather, because it was. Basic doctrine, not training, was the reason for this unpreparedness because it proved to be inappropriate for the war being fought.

Today we see our current basic doctrine alive and well when we look at our various flying training programs. The various missions and specialized tasks outlined in doctrine are being trained. Furthermore this training is some of the most realistic ever attempted. Because of this realism, tactical doctrine is being continually revalidated and tested and, thus, is alive and well.

However, the realism associated with combat support function training is somewhat lacking. As we saw, the policy guidance provided by AFR 66-17 and other aircraft and munitions maintenance training directives stress the development of technical proficiency versus operational competence. This lack of realism in support training, especially in an operational environment, was highlighted in Salty Demo when the realistically simulated attacks on the airfield created almost insurmountable recovery tasks. The publishing of AFM 1-10 in 1987 should help solve this problem by providing the foundation upon which the various combat support functions can structure their 'functional' doctrine. Once written, this functional doctrine can serve as the basis for the realistic training needed to develop the operational competency needed to function effectively in war.

Equipping and Sustaining Aerospace

Forces and Basic Doctrine

The equipping and sustaining of aerospace forces, like training, is more an understood implementing function of doctrine than a fundamental part of basic doctrine. However, unlike training, the equipping and sustaining functions are demanding in their reliance on a two-way relationship with doctrine. Unlike training or even the organizing

function, errors made in translating doctrine into equipment to fight with, and, more importantly, errors in integrating advances in technology into current doctrine are harder to correct and thus much more critical. Therefore, it is imperative that the equipping and sustaining functions be critically examined and pursued with doctrine being one of the key referencing criteria.

Regarding the equipping of aerospace forces, AFM 1-1 states:

Doctrine is the very heart of warfare. Our warfare systems must be designed to be...capable of carrying out our doctrine...It places a burden on Air Force leadership... not only to know current aerospace doctrine intimately but also to influence its refinement as emerging technologies lead to the development of new employment concepts.⁹⁴

Furthermore, AFM 1-1 notes that:

The role of doctrine in the equipping process is a two-way street: the development of emerging technologies may well influence the development of doctrine, but the procurement of weapon systems must primarily provide the capability to execute current doctrine.⁹⁵

AFM 1-1 is saying that we cannot disregard technological progress and the potential influence this progress may have on doctrine and weaponry. However, when equipping aerospace forces, the capability to execute current doctrine must be our primary concern. Buying weapons incorporating new and emerging technologies but not based on or supporting doctrine will only degrade rather than enhance our warfighting capability.

As AFM 1-1 warns:

In a world constantly being shaped by new discoveries, planners are often faced with a difficult choice between the horizons of new capabilities, as promised by future technology, and the urgent necessity to maintain a warfighting capability that meets current requirements...Therefore, the primary guidance in this process must be doctrine.⁹⁶

Keys to fulfilling this task of balancing new capabilities and current requirements can be found in a basic belief of aerospace doctrine. Doctrine has always stressed that the characteristics of speed, range, and

flexibility provide aerospace forces with unique capabilities not duplicated by land or sea forces.⁹⁷ Therefore, the Air Force must develop systems with the optimum mix of these characteristics. To restrict any one of these characteristics by design is to restrict the capability of that system to fully support doctrine. Doctrine must be of prime consideration in weapons design.

Part and parcel with equipping aerospace forces is the corollary function of sustaining those forces. As AFM 1-1 notes:

The warfighting capability of aerospace forces is not credible without the logistics capability to sustain our forces in the tasks of preparation, execution, and fighting. This requires a total logistics effort, both planning and implementation, that includes two prime responsibilities - to support the design and extent of force structure and to design the support system required to maintain and supply that force. Since logistics could well determine the limits of our operational capabilities, it must be given equal consideration in the planning process with research and development, training, and force structure.⁹⁸

This means when equipping aerospace forces we must consider how those forces will be supported in both peacetime and in war. Failure to consider how to maintain and sustain these forces may result in their inability to meet the demands of doctrine and ultimately their warfighting capability.

AFM 1-1 further notes:

The challenge is to equip today's forces sufficiently while developing the aerospace forces to fight and win tomorrow's war...Air Force research and development efforts must not only exploit new technologies, they must also push the limits of technology to discovery and breakthrough. Commanders must control their resources by establishing requirements based on objectives, threats, opportunities.⁹⁹

The challenge is to ensure doctrine is used to both push and pull the acquisition of weapon systems, and is pushed and pulled by our efforts to research and develop new weapons.

Additional Factors Affecting Equipping and Sustaining

The doctrine implementing functions of equipping and sustaining are often heavily influenced by factors other than doctrine which often override pure doctrinal considerations. Several more important outside factors are: budget restrictions, national security strategy, international agreements, and the perceived threat.

As with training, budget limitations can significantly affect the ability to equip and sustain to meet the demands of doctrine. In times of constrained budgets, the decision to upgrade a current system versus purchase new equipment, or targeting research and development efforts into improving proven technology versus seeking new breakthrough technology through pure research can have a significant bearing on how we equip our forces. Additionally, when money is limited the decision on how much should be spent on sustaining current forces versus investing in new forces will also affect how we equip. In all cases, the unconstrained demands of doctrine may have to give way to realities of budget restrictions.

Secondly, as with training, overall national security strategy may force certain aspects of doctrine to be stressed and supported at the expense of others, especially when constrained budgets are also a factor. This overall emphasis on supporting the national strategy may force a priority effort on equipage and sustainment in support of that portion of doctrine that best fits this strategy. For instance, the emphasis on a nuclear versus conventional warfare strategy may result in the priority being given to funding research and development and the acquisition of nuclear systems at the expense of conventional force structure and

support.

The affects of international agreements limiting conventional forces or international treaties prohibiting certain weapons such as chemical or biological weapons may override any demands doctrine may place on the acquisition of these weapons. In fact, the existence of such agreements may result in a change in doctrine itself, causing the banned weapons to loose their doctrinal basis.

Finally, the nature of the perceived threat may drive the emphasis being placed on how the Air Force equips to meet doctrine. For instance, if the threat of nuclear bombers attacking the US is believed to be very high, then air defense forces, both aircraft and missile forces, may be funded at the expense of other forces. On the other hand if this threat is thought to be very low, then only minimal funding may be provided to field a force to defend against this threat. While in both cases the doctrine of defensive air power is supported, the level of support differs based on the perceived threat.

Equipping and Sustaining Policy and Guidance

Air Force policy and guidance for equipping (the acquisition of weapons systems to meet the demands of doctrine) is provided through AF Regulation 57-1, *Operational Needs, Requirements, and Concepts*, and AF Regulation 800-2, *Acquisition Program Management*. Together, AFR 57-1 and AFR 800-2 outline the Air Force policies, procedures, and responsibilities for identifying, processing, and approving operational requirements which result in the research, development, test and evaluation, and procurement of new weapons systems.

AFR 57-1 details the portion of the acquisition process dealing

with the identification of operational requirements and needs. According to AFR 57-1, the vehicle for identifying new weapon system requirements is the Statement of Operational Need (SON). The SON describes equipment needs that cannot be met through changes in tactics, strategy, doctrine, or training, thus requiring the research and development of a new weapon system or the upgrade of an existing system to meet this operational need. Principle uses for the SON include: defining an operational need; documenting official validation of the need; furnishing preliminary requirements for research, development, test, and evaluation (RTD&E); planning; procurement; and operations and maintenance (sustaining) activities.¹⁰⁰

The System Operational Requirements Document (SORD), the other major acquisition document detailed in AFR 57-1, amplifies and refines the SON based on the proposed solution to the identified need. The SORD explains how to operate, employ, deploy, and support the proposed system and is written by the command that will operate the system.¹⁰¹

AFR 800-2 outlines the policies the Air Force will follow in the RTD&E and acquisition of weapons systems to meet the operational requirements detailed in the SON and SORD. This regulation also details the responsibilities of the various players in the acquisition process and the considerations and decisions that must be addressed by these players.¹⁰²

Within both regulations the concept that the process is need driven, that is, based on doctrine, serves as the basis for acquisition management policy. It is the operational commands, the users, who identify deficiencies in fulfilling their assigned missions that generate

the need for new systems. Throughout the process the operating and supporting commands as well as Air Force senior leadership are asked to review the system being developed to meet the identified operational deficiency to ensure the proposed solution will be operationally suitable and effective in fulfilling the deficiency. Furthermore, they also ensure the readiness and supportability (sustainment) of the proposed solution is considered during the design process and is verified during test and evaluation.

Doctrine and Early Air Force Equipping and Sustaining Activities

The period following World War II is notable for the controversy surrounding the establishment of the Air Force as an independent Service, and the division of roles and missions concerning air power among the three Services. During this period the Air Force vigorously defended what it felt were its assigned missions from attempts by the Army and Navy to develop similar mission capabilities.¹⁰³

As noted earlier, Air Force leaders came out of World War II convinced their long held belief in strategic bombardment had been vindicated during the war.¹⁰⁴ This conviction was further borne out by the final judgement of the United States Strategic Bombing Survey which stated:

Allied airpower was decisive in the war in western Europe...It brought the economy which maintained the enemy's armed forces to virtual collapse, although the full effects of this collapse had not reached the enemy's front lines when they were overrun by Allied forces.¹⁰⁵

Additionally, the advent of nuclear weapons at the end of the war simply reinforced the concept of airpower as a means of offensive action.

Air strategists were said to have recognized that the adaptability of nuclear weapons to delivery by air at great distances made the airplane at present, and its descendants in the future, the greatest offensive weapon of all times.¹⁰⁶

As noted earlier, quick review of the basic doctrinal manuals published during this time (AFM 1-2 in 1953, 1954, 1955, 1959, and AFM 1-1 in 1964) reveals the emphasis placed on strategic operations, and the growing emphasis being placed on nuclear operations. Additionally, the concept that nuclear forces would deter war at all levels began to be stressed. This emphasis on deterrence and the efficacy of nuclear operations, both strategic and tactical, is especially evident in the 1964 version of basic doctr. e. As a result, the long range strategic bomber and later nuclear capable tactical fighters were given first priority in funding.¹⁰⁷

The greatest controversy surrounding the strategic force buildup centered around the development of ballistic missiles. As General White noted in 1953, there was a deeply ingrained prejudice in favor of manned aircraft among flyers.¹⁰⁸ Though the ballistic missile was finally deployed in the early 1960s General LeMay noted they should only augment the manned bomber and at some future date supplant only a portion of the bomber force. He urged missiles be developed with the "utmost urgency" but stressed the need for more B-52s and that a follow-on bomber be developed at the earliest possible time.¹⁰⁹

Finally, the development of air defense systems and the growing performance superiority of jet interceptors over bombers resulted in the demise of large bomber forces and their requirement for escorting fighters. Bombers would now rely on speed, deception, evasive action, darkness, and bad weather while flying singly or in small formations to attack their targets. As a result of this adaption of doctrine to the realities of technological advancement, the escort fighters were released

to the tactical forces in and this mission abandoned.¹¹⁰

Though there was widespread belief outside the Air Force that the threat of a nuclear attack would deter potential aggressors, the Air Force believed any future war would begin with an air attack of the United States. Thus, the next priority for the Air Force was to provide the early warning radar network and interceptor aircraft needed to destroy attacking bombers.¹¹¹ The Soviets explosion of their first atomic bomb in 1949 breaking the US monopoly on this weapon coupled with the outbreak of the Korean War in 1950 helped to raise the priority of air defense in terms of funding support within the Air Force.¹¹²

The greatest problem with equipping in this era revolved around the tactical fighter forces. Because most of the funding went to building the strategic bomber forces the tactical forces bore the brunt of the funding shortages of this period.¹¹³ The development of a nuclear weapon capable of being carried on tactical aircraft and the outbreak of the Korean War helped the Air Force put more emphasis on ground support.¹¹⁴

Throughout this period the Air force had to persuade the Army that jet fighters were superior to conventional fighters for tactical air missions. Further, Army critics charged the Air Force with spending too much on strategic air power and too little on close air support. They also advocated that control of tactical air should be given to the ground commander.¹¹⁵ While the Army's criticism of the support for close air support was probably valid given the priority the tactical forces were placing on developing a nuclear versus conventional force, this problem was not one of doctrine but rather resulted from the emphasis national security strategy was placing on nuclear warfare.

The final result of this early period of doctrine and its

implementation in equipping the Air Force is best summed up by Colonel Drew when he notes:

Military budgets, force structure, equipment procurement,...were all based on the central doctrinal belief and the deterrence and warfighting decisiveness of strategic bombardment. Even tactical forces became ministrategic forces in the late 1950s and early 1960s. The crisis came in 1965 when the United States entered the Vietnam War and the bombing of North Vietnam began. American air power doctrine was found bankrupt in Vietnam because its underlying assumptions were untrue to the situation...The results were frustration, ineffective bombing, wasted blood and treasure, and eventually the renaming of Siagon to Ho Chi Minh City.¹¹⁶

While the lack of effective airpower was not the sole or even primary reason for the outcome of the Vietnam War, it is certainly true that basic Air Force doctrine did not support the type of war being fought. However, it is important to note the Air Force was fully implementing its doctrine with its equipping and sustaining actions throughout this early period. Basic doctrine had evolved as a result of technology placing greater and greater emphasis on nuclear weaponry and nuclear warfare. Additionally, as technology advanced the development of nuclear weapons doctrine evolved to accommodate these developments. The two-way relationship between doctrine and technology was in operation. Unfortunately, this evolving doctrine was not properly tested until Vietnam. As a result, both doctrine and the weapons demanded were not appropriate for the war we finally had to fight.

Doctrine and Today's Equipping and Sustaining Activities

Are current Air Force equipping and sustaining activities in concert with basic doctrine? As we noted earlier, doctrine should provide a general direction, a foundation for both equipping and sustaining efforts. In order to assess the role doctrine plays in these activities we must first define the Air Force's basic doctrinal beliefs.

As we noted earlier, AFM 1-1 currently outlines three basic beliefs concerning the use of Air Force forces. They are: air superiority is essential to conduction successful attacks and avoiding unacceptable losses; attack the enemy in depth with persistent, coordinated attacks involving air interdiction and close air support; and attack the enemy's heartland to destroy his industrial war-making capacity and will. Basic doctrine also notes that heartland attacks will have to rely on self-generated air superiority obtained by speed, maneuverability, tactics, deception, efforts to dissipate or defer enemy defenses, and weapons characteristics and employment. We also noted basic doctrine lists speed, range, and flexibility as essential characteristics that must be considered in the design of weapon systems. Finally, we noted that in addition to the basic beliefs, doctrine lists a number of specialized tasks the Air Force must carry out to support its doctrine and the overall national security strategy.

Since the end of the Vietnam War we have seen a resurgence of conventional and nuclear capable aircraft and missile systems capable of fulfilling the basic Air Force employment concepts outlined in basic doctrine. The Air Force tactical fighters added since the end of the Vietnam War are designed to provide air superiority (F-15, F-16), air interdiction (F-111, F-15E, F-16), and close air support (A-10, F-16) capability and, with the multi-role F-16, provide the airpower needed to meet all the tactical employment roles outlined in basic doctrine.¹¹⁷ Within the strategic forces, we also see doctrine being met by the various strategic nuclear and conventional bombers and missiles. As with the tactical forces, the Air Force's strategic aircraft and missiles are

currently capable of performing the long range strategic bombardment (heartland attack) mission. These systems rely on a combination of speed, tactics, maneuverability, deception, and weapons effects to gain the freedom of action required to successfully penetrate enemy airspace.¹¹⁸

As doctrine points out, however, force sustainment is equally as important as the equipping of aerospace forces. Again, in terms of readiness and sustainability, the Air Force is taking action to ensure these requirements are met in accordance with doctrine.

The Air Force is pursuing a two pronged attack in addressing force readiness and sustainability. The first approach deals directly with the force readiness issue by addressing the reliability and maintainability (R&M) of both current and new weapons systems. The second approach continues recent efforts to fund increases in spares and munitions stocks.

The Air Force's R&M 2000 initiative has a primary goal of decreasing weapon system downtime and thus, in effect, raising system effectiveness and increasing overall combat capability by buying weapons that perform reliably over time. The Air Force now considers R&M of equal importance to weapon system cost, performance, and acquisition schedule.¹¹⁹ According to General William Collins, Air Force Special Assistant for R&M, the initiative has five main objectives: increase combat capability, decrease support structure vulnerability, cut mobility requirements, reduce maintenance manpower, and reduce maintenance costs.¹²⁰

On the sustainability side we see improvements in the Air Force's spare parts and munitions stocks. The increase in spare parts stocks since 1980 has nearly doubled the Air Force's wartime sortie generation

capability. Furthermore, cannibilization rates are down by 50 percent and overall mission capable rates are up by 12 percent since 1980.¹²¹

Munitions stores have also improved in the last decade. Since 1981, the Air Force has improved its air-to-air munitions by 127 percent. Air-to-ground munitions stocks have increased by 55 percent in this same period. Furthermore, though a declining trend in munitions funding is projected through at least fiscal year 1992, there will be an integrated, steady acquisition program to improve total combat capability.¹²²

Though the existing air-to-ground munitions inventory permits the Air Force to fly 100 percent of the projected wartime sorties with full weapons loads, many sorties will be flown with general purpose rather than preferred munitions loads. Thus, weapons procurement has recently been concentrating on increasing the preferred munitions stocks.¹²³

Summary

Is basic doctrine playing an active role in the Air Force's equipping and sustaining activities? We believe the answer is yes.

As we noted, the Air Force has, at least since World War II, equipped its forces in line with basic doctrine. Up to the mid 1960s and the Vietnam War, Air Force basic doctrine had evolved to a point where both strategic and tactical nuclear operations dominated. As a result, nuclear versus conventional capability dominated Air Force weapons systems design resulting in equipment limitations at the start of the conventionally oriented Vietnam War.

Since then, we have seen basic doctrine return to a more balanced conventional war employment concept. Air superiority, Army support via interdiction and close air support, and long range strategic (heartland)

attack again form the basic employment concepts of Air Force basic doctrine. A quick look at the Air Force's current force structure reveals all three basic employment concepts are supported by modern high technology weapons systems.

On the force sustainment issue, we again see the Air Force taking positive steps to ensure basic doctrine goals are met. First, the Air Force has implemented a program designed to increase the reliability and maintainability of its weapon systems, thereby simplifying the required sustainment effort. Second, the Air Force has actively pursued a program of increasing both spares and munitions stocks and is attempting to buy preferred munitions to upgrade the quality of its munitions stocks.

Taken together, we see the Air Force's equipping and sustaining effort actively supporting basic doctrine.

Conclusion

According to AFM 1-1, Air Force basic doctrine is supposed to drive how the Air Force organizes, trains, equips and sustains its forces. The question we are trying to answer is whether basic doctrine does as it says.

In the case of organizing, we see doctrine playing only a weak secondary role at best. The fact today's organization fits doctrine is, in most cases, more a function of happenstance than design. However, there have been several recent organizing activities that seem to have considered doctrine in their implementation. Further, Air Force policy guidance concerning organization is fully in line with basic doctrine's general guidance.

Air Force training activities seem to carry a strong tie to basic

doctrine. As Air Force doctrine evolved after World War II, we saw the Air Force's training also evolve stressing nuclear versus conventional operations. The inability of the Air Force to initially fight in Southeast Asia was not because of a fault of training to doctrine, but rather, because the Air Force did. It was doctrine that was found lacking. Today, we see training, at least for the operational aircrews, being pursued with ever increasing degrees of realism developing aircrew operational competence at the direction of basic doctrine. However, away from the flightline, we see training more concerned with developing individual technical skill proficiency, which is important, but ignoring the need to develop the operational competency that results from realistic training. Hopefully, the recent introduction of combat support doctrine will provide the doctrinal basis for bringing the rest of the Air Force up to the same level of operational competence now evidenced by the aircrews.

Finally, the Air Force's equipping and sustaining activities seem to be in line with basic doctrine's guidance. Again, as doctrine evolved after World War II we saw the Air Force's force structure evolve to remain capable of employing in accordance with doctrine. Today's force structure is fully capable of meeting the employment concepts outlined in basic doctrine. Furthermore, the recent emphasis placed on readiness is fully in line with basic doctrine's direction to ensure force sustainment.

Is basic Air Force doctrine being implemented today? We believe the answer is yes.

NOTES

CHAPTER IV

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CHAPTER V

CURRENT DOCTRINAL ISSUES

by Colonel James E. Andrews

Introduction

Although basic doctrine provides a timeless foundation for the Air Force to structure, train and equip forces, and guidance to fight--doctrine cannot be static. Doctrine must be dynamic to keep up with changing environment, technology, and new mediums of operations. It is this very dichotomy between timeless fundamental principles and the need to adapt to a changing environment that is the root of conflict both in the past and in the future.

As we encounter nearly every issue that concerns the Air Force today, fundamental doctrine is at the heart of every controversy even though doctrine may not be portrayed in the discussion. It is from a long list of controversial areas that we have picked combat support, close air support, and space to discuss current problems. Discussion of these areas focuses on

forming a new doctrine, adjusting to a changing environment, or attempting to establish a warfighting capability. Discussions are not an attempt to, nor are they designed to be an in-depth analysis of the current controversies. Rather, it is desired that a review of combat support, close air support, and space doctrinal issues will provide a good appreciation for some of the problem areas and complexities facing the Air Force as the changing environment and need for adjustments in doctrine arise.

Close Air Support

Questions have arisen over the past couple of years that challenge the basic doctrine that envelopes close air support (CAS) as written in Air Force, Army, and the AirLand Battle doctrine. Individuals interested in military reform have questioned the very future of CAS on the modern battlefield and the capability of the Air Force and Army to conduct it. John E. Krimp, a former Pentagon Director of the DOD Office of Operational Testing and Evaluation and currently vice chairman of a consulting firm for defense contractors on the integration of tactics and technology, foresees the role of CAS as only minor in future wars on the high-intensity battlefields in Europe because the lethality of Soviet defenses have essentially made the concept of circling a battlefield to drop bombs obsolete.' With the Army's development of improved artillery, rockets, and helicopters to support troops in contact, General John R. Galvin, the NATO Military Commander

has commented that the Army must take pressure off aircraft by taking more responsibility for close in battle allowing Air Force assets to attack deeper targets.¹ Senator J. Dixon, Democrat-Illinois, sponsored an amendment to the FY89 Defense Appropriations Bill that directed the Secretary of Defense to assess the feasibility of transferring the CAS mission from the Air Force to the Army.² The Army's growing fleet of AH-64 helicopters could possibly take over the CAS role and currently display characteristics that out perform any Air Force aircraft in the CAS environment. Along with the rhetoric, the hottest issue today concerns the replacement aircraft for the A-10. The central issue is whether the next generation CAS aircraft will be dedicated strictly to the CAS role as the A-10 was or have multi-role responsibilities. In reply to all the current discussions, both General Carl E. Vuono, Army Chief of Staff and General Larry D. Welch, Air Force Chief of Staff fully agree that current doctrine is adequate and foresee no doctrinal changes to the CAS mission nor a transfer of mission from the Air Force to the Army. The Army will continue to establish requirements and the Air Force will meet the demands with fixed-wing assets.⁴

Close air support doctrine has evolved from experiences during the North African Campaign in World War II as part of the air support mission that provided fire power against enemy forces in close proximity to allied ground forces. The need for close coordination between the air component and ground

commanders that is central to the success of the mission was established at that point. During the Korean Conflict, there was a lack of communication equipment, aircraft designed to perform CAS, proper ordnance needed to maximize CAS, and the tactical air control system.³ However, with the advent of the jet age, the F-80 and F-84 ushered in the characteristics of increased speed, mission responsiveness and survivability that slower propeller driven aircraft did not have. With the passage of time, lessons learned during the Korean Conflict were largely misplaced by experiences during Vietnam when forward air control, the tactical air control system, and streamlined communications procedures vastly improved the responsiveness of CAS to the Army commanders in contact with enemy forces. During the Vietnam conflict, a myth developed that supported slow moving propeller driven aircraft as the best CAS weapon system because of their long loiter time, weapons delivery accuracy, and ability to sustain combat damage and still fly. The myth was based on the South Vietnam experience where the threat was relatively low and the quality of air resources high.⁴ It is true that slow moving aircraft had proven more capable than faster jet aircraft to deliver ordnance and meet the demands of the ground commander in Vietnam, but all aircraft of the period except the A-7 bombed using manual systems that delivered weapons without the aid of computer directed weapons delivery systems used today. The slower the speed, the more accurate the delivery of the weapon

and since propeller driven aircraft flew substantially slower than jets, weapons were dropped with greater precision and with better results. To the ground commander, the precision of the delivery was all important for his troops in close contact with the enemy and survival of the aircraft and crew became secondary. It was because of this mind-set and the ability of CAS to operate in a relatively low-threat area when compared to the European high-threat environment, that the Air Force developed the A-10 as the primary CAS aircraft of the 1970s and 1980s. After Vietnam, military doctrinal thinking returned to Central Europe and developed a doctrine of using both the slow moving A-10 plus fast, multi-role F-16 and F-15 fighters to support the CAS mission. Today, the Air Force maintains 10 tactical fighter wings of A-10s and A-7s designated specifically to the CAS mission totalling 28 percent of the tactical air forces. Additionally, 50 percent of all multi-role aircraft can fly CAS and battlefield air interdiction missions.' By contrast, there are currently less than three fighter wing equivalents dedicated to deep interdiction missions and seven wings designated for air superiority. "The bulk of the fighter force is essentially multi-role because the United States lacks the ability to perform all potential TACAIR missions simultaneously."

Close air support is upheld in Air Force and Army doctrine. Although AFM 1-1, Air Force doctrine notes the primacy of air superiority, the manual recognized the importance of CAS by

stating "close air support can create opportunities, protect maneuver, and defend land forces." Army doctrine references CAS in Fundamentals of AirLand Battle by stating that "all ground operations above the level of the smallest engagements will be strongly affected by the supporting air operations of one or both combatants."¹⁰ The Army's dependence on Air Force support is further emphasized in the Army's FM 100-5, *Operations*, where it states that "cooperation with the US Air Force will be vital always. . . ."¹¹

The Army views CAS as critical to their ground operations because of the ability to deliver a variety of weapons at critical times and places to fill in gaps between artillery and helicopter missions. To meet CAS requirements, the Army considers fixed-wing aircraft as essential assets. Helicopters are organic maneuver units designed to destroy enemy armor. Although this role may place helicopters in the same close proximity of troops as CAS aircraft, the CAS mission is secondary. The Army's Joint Air Attack Team concept requires attack helicopters, artillery, forward air controllers, and fixed-wing CAS aircraft to be employed in concert to maximize the firepower effectiveness of all weapons systems.¹² Furthermore, Army doctrine provides for decentralized command, control, and execution of attack helicopter missions. Originating at the brigade level, responsiveness to the overall battle cannot be guaranteed as with centrally controlled Air Force assets at the theater command level.

Close air support must be massed against regiments and divisions and not dissipated in a piecemeal fashion against small, fleeting, or non-vital targets. Only fixed-wing aircraft can mass the required ordnance over the necessary distances in a timely manner to perform the theater CAS missions.¹³ When the requirements to perform the CAS mission, such as weapons capabilities, loiter time, flexibility, etc., are considered, it becomes clear that Army and Air Force CAS systems and methods have unique, but complimentary capabilities to provide air-delivered fire support to land forces.

There are two possible approaches for a new CAS aircraft. One, optimizes the aircraft's speed for the penetration of enemy defenses, uses sophisticated avionics for survivability, and incorporates the CAS mission into the overall battlefield air interdiction (BAI) mission. The second approach maintains the traditional characteristics of a dedicated CAS aircraft requiring slow air speed, capability to sustain damage and survive, and have long loiter capability. These two courses of action are at the heart of future CAS doctrinal controversy and are at the center of selection of the next generation of CAS aircraft.

Whatever the final decision, the next CAS weapon system must meet the needs of the Army and AirLand Battle doctrine. To meet the challenges of a fluid, non-linear FLOT, the CAS aircraft must be responsive to commanders and flexible enough to accomplish both CAS and interdiction missions under all

weather conditions and at night. Not only must it be able to locate and identify the target accurately, it must be able to carry a wide range of weapons to ensure target destruction. Finally, it must be able to survive the full spectrum of enemy defenses.¹¹ Close air support can not be viewed as an independent mission, but its success is tied to the success of Army forces at the FLOT, air interdiction sorties, and the air superiority campaign.¹²

Most of the rationale for a dedicated CAS aircraft emanates from the impression that the most significant element of the high-threat area is aircraft vulnerability to enemy small arms ground fire.¹³ Proponents believe that the ideal weapon system to fit this profile is a slow, armor plated, stealth aircraft that can ensure target acquisition, take hits, and still survive. Since today's defenses are so pervasive on the battlefield, avoidance of hits in the high-threat environment is impossible, therefore the aircraft must be able to survive the hits. However, "the added weight of this armor ensures the fulfillment of the prophecy of considerable 'punishment' as it contributes to reduced speed and reduces maneuverability, thus making it considerably more vulnerable to enemy fire."¹⁴ Not only does this line of thought fail to account for the vast majority of Soviet defensive weaponry that cannot be countered by armor plating, but that the aircraft must be able to reach the target area through an extended area of varied lethal defensive weapons that no amount of armor plating can protect

against.

Far better than being able to accept being hit by enemy weapons is the ability to avoid contact in the first place. To survive in this intense European environment, aircraft must avoid the threat rather than absorb hits. Although the cold reality must be accepted that there are high-threat areas that no aircraft can survive regardless of its capabilities; the intensity at the FLOT will have to vary due to the movement of force, degraded enemy air defenses, munition expenditure, chaos of war, and attrition due to defense suppression and extended combat.¹⁸ Areas along the FLOT will change as the battle flows along a non-linear line of troops. It is into the non-static battlefield that CAS aircraft will perform its mission using avoidance of lethal enemy defensive systems as their primary defense. Success will require the ability to be highly maneuverable, sustain high speeds and "G" forces, and possess an integrated, automated threat protection and countermeasures avionics package in addition to standoff target engagement capability.¹⁹

The current debate over the procurement of a dedicated CAS aircraft or development of a new multi-roled aircraft can not be narrow sighted and must take the overall picture into consideration. The commanders of forces engaged in combat are not only concerned with the results of CAS mission, but are greatly affected by targets designated for BAI which are largely determined by the Army. As a follow on, even the air

interdiction campaign has a significant affect on the battle, although of lesser impact for those at the FLOT. The CAS and air interdiction (AI) missions are mutually dependent, inseparable, and both are totally integrated into the land battle in a combined arms scenario at the FLOT, in the rear areas, and well as beyond the FLOT.²⁰ The fact that an aircraft has the capability to engage in air-to-air combat, and interdiction does not negate its support for ground forces. Air superiority is essential to the AI mission and the defense of ground forces and air bases to attacks from enemy air forces. The combination of all tactical air missions is required for the successful prosecution of the AirLand Battle.

Apportionment and taskings for all missions is the responsibility of the Joint Force Commander (JFC), usually an Army general, based on the requirements of the situation, not on the desires of any particular service. Just as CAS supports the Army, both the Army and Air Force support the objectives, missions, and strategies of the JFC who is responsible for the overall theatre campaign.²¹ As part of the theatre operations, all TACAIR missions are coordinated to support the land battle and execution of the air war including CAS missions against high-priority targets will be in conjunction with BAI. Since CAS and BAI support the land battle in the immediate and near term, BAI must be closely coordinated with the interdiction campaign resulting in the potential for close, deep, and rear TACAIR support at the same time. The major distinction between

CAS or BAI will be the proximity to friendly forces and required procedures--not the location of the mission.²²

Systems and procedures required to perform the CAS mission are unique and cannot be confused with those of the BAI mission. The use of a multi-role fighter will require special, dedicated training in CAS. However, the multi-role fighter will greatly increase flexibility and responsiveness to the JFC to prosecute the battle at several levels. As such, the CAS mission is essential not only at the tactical level, but at the operational levels of war. Although striking against armor and tanks may be critical to the battalion level, the ability to mass against regiments and then combat support elements is critical to the theater battle. It is the responsiveness to move from one priority to the next that is the strongest attribute of air power.²³ The necessity to meet a wide spectrum of taskings requires a high-degree of flexibility and a force structure capable of shifting between missions depending on the Army's requirements and battlefield situation.²⁴

To be effective in combat, close air support assets must be able to survive the wide array of enemy defensive weapons encountered in the area of the FLOT. Near the front lines, CAS aircraft will encounter improved surface-to-air missiles, antiaircraft artillery, and small arms weapons that have longer range and lower altitude engagement capability than previous weapons.²⁵ Significant improvements have been made regarding

"G" capability, lethality of the warhead, accuracy of the guidance system, jam resistance, envelope expansion, and the potential for multi-target engagement.²⁶ Additionally, the air-to-air threat with all-aspect look-down, shoot-down capability, small arms, and antiaircraft threats must be considered.

Survivability in the intense defensive environment of today depends on five factors. Speed, maneuverability, electronic countermeasures, force packaging, and hit tolerance must all be combined as characteristics of the CAS weapon system to maximize the ability to ingress to the target, destroy the target, and successfully egress the high-threat area.²⁷ At the same time, the aircraft must be able to locate and destroy designated targets. "The main goal in survivability is to avoid getting hit. Speed and maneuverability make the biggest contribution to this end."²⁸ Speed and maneuverability create as much distance as possible between the aircraft and missiles or bullets to defeat their tracking. A CAS aircraft flying into a densely defended target at high speeds and low altitudes needs the added protection of electronic countermeasure and a support package to provide local air superiority, SAM, anti-aircraft suppression, and jamming of enemy threat radars. A critical point to remember is that to be effective, the entire force package must be compatible in speed and maneuverability. Today's slow moving A-10 cannot perform in the speed range where the faster aircraft that would be part of

its support package display their optimum combat performance. Finally, redundant systems, structural paths, and ability to keep flying even though major portions of the flight control surfaces may be damaged are necessary to aid the aircraft to successfully complete a mission. AirLand Battle doctrine depends on the Air Force for a survivable attack force. "A fast maneuverable aircraft, capable of using ECM and compatible with force packaging will give us the greatest chance of destroying any target that the Army identifies on the front lines or deeper within enemy territory."²⁹

The Army's Training and Doctrine Command designed the AirLand Battle doctrine for the perceived battlefield of the 1990s and beyond based upon a Soviet and Warsaw Pact threat. The basic philosophy "is to make the enemy react to us, denying his objectives of gaining numerical advantages on the ground and superiority in the air at the forward line of troops."³⁰ To accomplish this task, advancing Soviet troops and reinforcements must be subjected to as much firepower as possible before they reach the FLOT making the value of BAI and CAS equally important. The next battlefield will no longer have stable well-defined fronts, rather a non-linear line of troops with the FLOT ebbing and flowing through a chaotic and highly lethal environment where the ability to assume any air space is safe or to distinguish linear battle lines is history.

A dynamic non-linear battlefield will require CAS in the traditional role and at the same time, strikes will be called

in deeper into the enemy territory and to the rear of the FLOT. This new concept will make it essential that CAS assets be capable of carrying out AI or battlefield AI missions in addition to traditional CAS missions.³¹ By virtue of the multiple requirements, CAS aircraft will have to be a multi-roled fighter that is survivable on all sides of the FLOT and posses characteristics that will enable it to exist with the multi-role AI fighter. In developing AirLand Battle doctrine, TRADOC has transformed from the once dogmatic requirement for a dedicated CAS aircraft that would only perform the CAS mission such as the A-10 to an appreciation of the importance of the AI and, especially BAI missions. This has led to a doctrinal statement supporting tactical fighter aircraft performing both CAS and AI.³²

Space

The Department of Defense (DOD) became involved in space over forty years ago. The services pioneered the research and evaluation of captured German V-2 rockets when both the Army Air Corps and Navy were tasked with the investigation of a possible earth circling satellite. As part of the study, the RAND Corporation completed the *Preliminary Design of an Experimental World Circulating Spaceship* study in 1946 that included the first detailed examination of the military potential of using satellites for surveillance, communications, attack assessment, and weather forecasting.³³ By 1955, national policy advisors called for the peaceful exploration of

space to preserve freedom of action in space for the development of future military satellites.

In 1957, the Soviet Union demonstrated advanced missile technology with the launching of Sputnik I. Sputnik I, in conjunction with a growing Soviet nuclear capability, motivated President Eisenhower to place space objectives relating to defense as his highest priority. As a result, DOD was placed as the central organization responsible to oversee all space activity and one year later, the National Space Administration (NASA) was created to oversee civilian space research. Responsibility for the space program then vacillated for the next twenty years from centralized control by the Advanced Research Projects Agency, to the individual services, to the Air Force for research and development and operation of DOD satellite systems, to individual services with the Air Force as lead in development, acquisition, and operation of systems.³⁴ There was no clear cut objective of the military space program until the 1980s which left behind an absence of defined space doctrine directive enough to "generate military requirements for space or to design, or redesign, an organization appropriate to plan for and operate space weapons and then space-based support systems."³⁵

By the 1970s, space systems were able to provide real time operational requirements for surveillance, intelligence, command and control, navigation, and early warning of ballistic missile attacks. An anti-satellite system was under

development, but it was cancelled due to nuclear treaty requirements. Each year, space became more vital to the national security of the United States, and finally President Reagan issued a national space policy statement that emphasized the importance of military space roles to enhance national security in 1980.³⁶ This historic statement foreshadowed the requirements that space systems must be survivable, access to space must be assured, and that space should be exploited for military purposes. As a result, Air Force Space Command was activated followed by Naval Space Command and culminating in their merger as a unified command in 1985 as the United States Space Command. The new US Space Command finally placed the responsibility for all military operations in space under one central organization.

Current US policy requires that: (1) There be assured rights of passage for space systems; (2) The sovereignty claim to outer space by any nation be rejected; (3) The United States has the right to pursue activities in support of self defense; and (4) International cooperation is encouraged in the scientific and economic exploitation of space.³⁷ In support of US policy, the DOD recognizes that space is a medium like land, sea, and air in which military operations might be conducted. Control of space is therefore a vital element of US national policy in the use of force enhancement and force application. The DOD policy toward space is three pronged: (1) Enhance deterrence or, if necessary, defend against an enemy attack;

(2) Assure that forces of hostile nations can not prevent our own use of space; and (3) Enhance the operations of US and allied forces by space systems.³⁸

Although the Air Force has a succinct policy concerning space, the development of a space doctrine has become an issue of controversy. In 1959, Air Force doctrine replaced the word "air" with "aerospace" in AFM 1-1. With this simple change, space doctrine was tightly bonded to air operations and the aerospace environment was defined as an operationally indivisible medium consisting of the total expanse beyond the earth's surface.³⁹ The term "aerospace" in Air Force and space doctrine incorporated the characteristics of space and air into one neat package and has become a battleground of controversy within the Air Force and Space Command.

Proponents of separate air and space doctrine argue that to force fit the term "aerospace" to include all mediums above the earth's surface does not agree with over a quarter of a century of space experience in peace, crisis, and conflict. The differences in environment, characteristics, capabilities, missions, and specialized tasks between air and space make doctrine precepts in AFM 1-1 applicable only to air forces and not space forces.⁴⁰ The space environment is physically separate from air, both in flight capability and forces required for flight. The physics of orbital flight that is required outside the earth's atmosphere are distinctive from the physical parameters of flight in the atmosphere and define

a boundary of space. "The absence of gravity and a molecular environment provides a distinctly different operation regime than the atmosphere."⁴¹ The threshold established when the atmosphere changes to a hard vacuum where weightlessness occurs provides a distinct operating regime far more vast and governed by a completely separate set of physical laws than the atmosphere. Although AFM 1-1 states that "each force derives its intrinsic capabilities from the characteristics and medium in which it operates."⁴² The medium and characteristics of space and air forces are so fundamentally different that the capabilities of each is fundamentally different.⁴³

Doctrinal application towards space went through several changes through the years that finally resulted in the deletion of space operations from the list of Air Force missions and fully integrated space into the remaining nine missions. The results of the integration of space and air principles into a single comprehensive list of aerospace principles has caused current space doctrine to be constrained by national policy and the misapplication of air principles to space. There have been "few if any statements of unalterable truths regarding the conduct of military operations in space."⁴⁴ Current space doctrine reflects a political reality formulated and, promoted by senior Air Force officers who have a base of operational knowledge rooted in the air experience not space.⁴⁵ Instead of broad timeless fundamental doctrine dealing with the purpose of the military, the nature of war, and the relationship of space

to other national instruments of power, current space doctrine is constrained by national policy. As late as March 1989, when USAF/XO circulated a proposed draft for a new AFM 1-1, Air Force Space Command replied that, "The draft inadequately addresses the unique characteristics of the space environment and space operations, and the important role space forces play in our national security posture today."⁴⁴

AFM 1-1 states that "aerospace allows potentially unlimited horizontal and vertical movement for aerospace warfare systems. The capacity to maneuver freely in three dimensions allows our forces to exploit the characteristics of speed, range, and flexibility."⁴⁵ These three characteristics are at the heart of air doctrine for aircraft, but are not the key characteristics that should be used to describe the military capabilities of satellites as effective military assets. "These characteristics in no way capture the global context and unseen but ambiguous nature of satellite operations that should comprise the very core of space doctrine."⁴⁶ Space systems are capable of very little movement in either the horizontal or vertical vector once they are placed in orbit due to laws of physics and are particularly unmaneuverable due to energy requirements. Speed is of value to space forces and must essentially remain constant to keep the space vehicle in a stable orbit to perform its mission. Range is inconsequential as distance around a space orbit has very little meaning to the overall value of a satellite. Since satellites are mostly

oriented to the accomplishment of a specific mission, there is very little flexibility if any. "Technologically sophisticated, highly reliable space forces are essentially the antithesis of flexibility ascribed to aerospace forces in *Basic Aerospace Doctrine*.⁴⁹

The characteristics that should be applied to satellite operations are complacency, pervasiveness, and timeliness. Satellites, in addition to manned or unmanned spacecraft can be employed in earth's orbit for an extended to indefinite period of time. Space systems are complacent because they are maintained in their wartime position and in a high state of readiness and are capable of immediately providing support throughout the continuum of conflict.⁵⁰ With space systems, there is no requirement for generation of forces, deployment, nor training in the wartime mission. Once in orbit, the space vehicle is ready to perform its mission. Space forces are pervasive because they operate in a medium that is all-encompassing, surrounding the media of land, sea, and air.⁵¹ This characteristic enables space vehicles to operate over both enemy and friendly territory making possible the continuous monitoring of the status and readiness of the enemy. The element of surprise is diminished and the ability to gain sanctuary by the enemy is greatly reduced except for weapons that may also use the medium of space. Since satellites are constantly ready to perform their mission and can provide near-instantaneous information, they exhibit the characteristic

of timeliness.⁵² From this, they can aid in the speedy application of force by providing instantaneous information to the battlefield commander.

AFM 1-1 assesses the capabilities of aerospace forces as: "responsive, mobile, and survivable; able to show presence, deliver destructive firepower, and provide unparalleled observation."⁵³ Although some of these capabilities may apply to space forces, a more accurate assessment is "to provide accessment and linkage; capture the high ground and elude the enemy and transfer large volumes of information to facilitate application of precise, unimpeded force on the enemy."⁵⁴

The principles of war as defined in *Basic Aerospace Doctrine*, establish one of the foundations that doctrine is built upon should apply equally to all aerospace systems, both air and space. One question to ponder here is whether or not the aerospace principles of war are compatible with the characteristics of the space medium. The principle of the objective is the primary element in the successful conduct of any battle or operation. AFM 1-6, *Military Space Doctrine*, states that the US has not yet determined our real military objective in space, but it does provide for the basic philosophy of free access to and transit through space for peaceful purposes by military and civilian sectors. Also, space weapons should be able to directly damage earth based counter force and counter value targets, and suppress earth-based enemy defenses to improve penetration by other

weapons."² Conflict over the support of the Space Act of 1958 that declared space open for peaceful exploration and the use of space for strategic purposes has caused divergent doctrine that has delayed the development of space capabilities and solidification of a single objective. The principle of the offense could apply in space, but present orbital forces offer little if any capability to be used as an offensive weapon because of technology and policy constraints. Economy of force is particularly important in space because of the high price of equipment and the specificity of function for each satellite. The impact is that as few satellites as possible to do a job for as long as possible are employed in space leaving little resources for backup on the ground or in space to be used in case of destruction or failure of the primary system. Today, space systems must service more than one user and therefore violate the principle of centralized control. The formation of US Space Command as a unified command should help solve this problem, but as long as space systems service several agencies, the problem will remain in varying degrees. Although space systems require large amounts of energy to maneuver, attacks against orbiting space craft will be a one-to-one engagement and therefore negates the advantages of the principle of concentration of forces in the terrestrial environment. Only through building a wartime surge capability of spacecraft on the ground at great cost could forces be concentrated at a time and place critical to the success of a battle. Flexibility and

maneuverability are nearly nonexistent in space. Space systems are anything but simple and represent the highest expression of technology in order to survive the hostile space environment, maintain communications, provide power and maintain altitude. Today's satellites are almost defenseless and cannot exploit the principle of defense. If an aggressor has enough time to observe a satellite, he can determine an appropriate attack against its inherent weaknesses. The great distance satellites are from the earth contribute to their inaccessibility and some security, and if they are broken or fail to function, they continue in orbit, thereby providing some uncertainty to the earth-bound target planner as to the appropriate target to destroy. Surprise can be achieved by deception and attacks that bypass the restrictions of orbital mechanics. Any attack through the movement of orbital trajectories is observable and predictable. Because of the current state of technology and limited number of tracking stations, the battle commander cannot have a constant picture status and location of an enemy's satellites. As a result, any decision made by a commander will be on past information and constrained by tracking station capabilities which will deny him the advantage of timing and tempo. Moving, supporting, and maintaining warfighting capability in space is a problem central to every mission. Successfully completing a mission with logistic constraints is as applicable in space as in the terrestrial air environment. Finally, the principle of cohesion will be

required in space, but becomes more difficult to maintain as forces disperse.

Although the principles of the objective, economy of force, control, logistics, and cohesion, which are very broad, fit the space environment, the principles of concentration, flexibility and maneuver, and simplicity do not. Currently, the principles of offense and defense do not apply in space because of the state of technology. Security, surprise, timing, and tempo are applicable to space, but in a completely different manner than in the air environment.

AFM 1-6 recognizes the benefits of exploiting space for military advantages by chartering the Air Force "to provide forces for controlling space operations and gaining and maintaining space superiority."⁵⁶ From this premise, clear objectives must be formulated to focus on the in-space destruction of enemy satellites and by terrestrial destruction of earth-based laser ASATs. To meet these objectives, US Space Command must develop clear operational doctrine derived from basic doctrine that defines "the types of personnel and equipment needed to fight a war in space, given a certain level of technology."⁵⁷ To support the AFM 1-1 requirement to get enough men and equipment to the right place at the right time, operational doctrine should lead to the development of reliable, responsive, flexible, on-demand access to space.⁵⁸ Without this capability, a superiority doctrine is not possible and its development may very well change the nature of space

operations. Finally, specific weapons systems must be developed to support tactical doctrine derived from operational doctrine requirements and not based on current technological levels.

In the future, "the evolution of space operations away from a solely peacetime orientation to one stressing warfighting requirements must continue in order to deter aggression and, if deterrence fails, succeed on the battlefield."³ Military doctrine and warfighting capability must be integrated to keep in step with new technology incorporating the same principles of sustainability to air, land, and sea forces. Commanders of future forces will depend on space for timely and flexible surveillance, communication, and navigational support. "Space control must become an integral part of tactical operations."⁴ Combat support from space systems will provide the tactical advantage needed for success on the modern battlefield. Space will be a battlefield or potential battlefield in the future for the same reasons that the oceans and air became battlefields. Once a medium has been exploited for military purposes, it can no longer be a sanctuary. The nation's security requirements of free passage, secure lines of command, control and communications, surveillance, navigation, and strategic warning are all fundamentally tied to space operation. Space power will assume a decisive role in future combat operations. The enemy's capabilities must be negated using the space medium through space-based surveillance,

warning, and attack assessment for the national command authorities. Finally, space programs must be understood and attainable to ensure that space remains an area of operational responsibility for the Air Force.

AFM 1-6, restates current policy instead of explaining how US space forces will employ in future conflicts.⁴¹ When doctrine is externally constrained in defining principles, it becomes merely another statement of national policy. Space doctrine is still young and needs to establish fundamental doctrinal theories before being constrained into organizational and environmental doctrine. By forcing environmental doctrine into air doctrinal thinking, three compromises to a pure space doctrine had to be accomplished. The characteristics of the systems, capabilities of space forces and the environment itself greatly differ from those associated with air. Potential warfighting missions are acknowledged in AFM 1-6: "Space-based weapon systems could contribute to deterrence in peacetime and to more rapid conflict termination or increased survivability in war."⁴² However, the effectiveness of space systems must be compared to alternate solutions and the impact of combined surface and space operations on national security objectives. At first glance, it would appear that space doctrine is free to expand to develop itself along the lines of military necessity, but in reality, it remains subjected to the constraints of national security policy that could close avenues of thought and revolutionary concepts of space before

pure space doctrinal concepts are conceived.

AFM 1-6 recognizes the changes that must occur to ensure the benefits of space are available for national security and military purposes. The Air Force is "to provide forces for controlling space operations and gaining and maintaining space superiority."⁴³ To accomplish these requirements, the Air Force must develop space systems that integrate national security policy with military structure to increase effectiveness, readiness, reliability, survivability, and sustainability.⁴⁴ Additionally, military goals must be clearly understood and there must be close cooperation with NASA and the civilian sector.

The Air University *Space Handbook*, AU-18, condenses four areas of future growth that AFM 1-6 specifies for military space activities:

Expansion of space support operations with on-orbit resources that include space stations, shuttle, orbital transfer vehicles, energy generators, and manufacturing processes.

Development and continued evolution of quick reaction launch capabilities with short turn-around from more survivable launch facilities.

Development of the capability to support multi-purpose operations in space (such operations could include space-to-space, space-to-earth, and earth-to-space activities.

Development of space systems for rapid termination of any military conflict...

Space systems and supporting forces must be within the unified and specified command structure and used to develop plans, programs, policy, and employment strategies for the unified and specified commands. Training and education for those directing the space program must also be included. The Air Force must manage all phases of the space operations from launch through refurbishment and coordinate with other government agencies. Superior space-related technologies must be applied to update space forces. This requires the integration of a strong research and development base, a responsive acquisition cycle, and encouraging innovation to take advantage of science and technology.⁴⁶ With the potential for enemy attacks as airpower has today, the future of the Air Force is inextricably tied to space.

Combat Support

The aerospace system is composed of the aerospace vehicle or weapon system (aircraft, missile, or space system) and aerospace forces consisting of people, materiel, facilities, and information that provide the specified and unified commanders the capability to fight.⁴⁷ As part of the aerospace system, forces perform two basic functions: combat operations and combat support. It is combat support that creates and

sustains combat forces during wartime and in peace, throughout the entire spectrum of conflict and extends from the combat theater to the national defense industrial base. Fundamental to the success of aerospace forces in conflict is the survival of operating, support, and industrial bases which are the responsibility of the combat support forces under the broad definition of "logistics."

In the early 1980s, Lt Gen Leo Marquez, the Air Force Deputy Chief of Staff for Logistics and Engineering (DCS/L&E) directed the development of an Air Force combat support doctrine. He believed that Air Force doctrine, as written in AFM 1-1, was exclusively operations oriented and that the void left by an absence of logistics doctrine had to be filled at the basic doctrinal level. He formed a team that began with the formulation of a basic definition of logistics based on the premise that the Air Force had a very limited view of logistics and that there was no universally accepted logistics definition to build a doctrinal foundation upon. After studying the principle of logistics in AFM 1-1, the team modified it to read: "Logistics is the act and science of preparing man and machines for combat by obtaining, moving, and maintaining warfighting capability."** With this definition as guidance, logistics became, in the broadest sense of the word, all of the combat support functions that contribute to the warfighting capability.

Based upon General Marquez's recommendation, the Air University Center for Aerospace Doctrine, Research, and Education (AU CADRE) joined the Deputy Chief of Staff for Logistics and Engineering and formally agreed to encompass all logistic and support functions under the umbrella of Combat Support. Prior to the agreement, logistic's doctrine was formulated by the Air Force DCS/L&E while combat support doctrine was developed by the AU CADRE. The combination of both concepts into a single combat support definition provided for the creation and sustaining of combat capability in addition to training, organizing, and equipping of aerospace systems for employment.⁶ At this point, a long-term goal was established to fully institutionalize combat support doctrine at a level commensurate with that of employment doctrine in the basic, operational, and tactical manuals.⁷ The result of Lieutenant General Marquez's efforts was the publication of AFM 1-10, *Combat Support Doctrine*.

Since the publication of AFM 1-10 in 1987, there have been several areas of controversy. One area is the possible disconnect between *Combat Support Doctrine* and AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*. First, proponents of combat support believe that combat support should be employed in the same manner as operational forces as discussed in AFM 1-1 under the elements of war. Proponents believe the AFM 1-10 does not align itself very well with our basic doctrine and that it is written in isolation, perhaps as

a stand alone document that does not consider the relevance of support to actual employment.⁷¹

A second area of controversy concerns the applicability of the characteristics of aerospace forces to support functions. Since speed and flexibility are characteristics defined in AFM 1-1, they should apply to all support functions as well as operational forces. However, discussion on the Planning Program and Budget System (PPBS) and the acquisition system in AFM 1-10, does not address these characteristics and may further perpetuate the already cumbersome contracting bureaucracy instead of directing the way they should contribute to fighting and winning a war.⁷² Too much is concerned with the industrial process as it applied to World War II and not enough direction is given to the relevance of acquisition throughout the spectrum of war from low-intensity conflict to a possible short, violent war in Europe.

Thirdly, there appears to be an imbalance between the services desires for new glamorous exotic weapons and the real world planning for support equipment and spare parts that are essential to provide combat capability for the operational forces. One reason for this imbalance can be partially explained by the dominance of the services in logistics activities and their inclination for 'equipping' their forces in preference to 'organizing' and 'training' them.⁷³ Results of this imbalance affects the unified and specified CINCs who have only a limited control over logistics matters despite

requirements to deploy and employ forces and lack programmatic authority to influence the imbalance between modernization and force structure on the one hand, and readiness and sustainability on the other.⁷⁴ Moreover, program success is many times judged on the merits of costs, numbers and equipment instead of real combat capability. Correcting this problem becomes a matter of doctrine that directs military capability through a balanced program for creating a modern force structure that is both ready and sustainable.

Although AFM 1-10 reflects industry's reliance on foreign resources and the possibility of depleting those resources during periods of conflict, it does not direct methods of preventing or overcoming the depletion of the resources. For example, over 25 percent of all aircraft spare parts were produced by foreign sources in 1984, which showed a rise of 12 percent in 4 years.⁷⁵ This reliance on foreign sources makes it imperative that doctrine be spelled out to provide guidance throughout the spectrum of war to counter an embargo with varying degrees of action. Doctrine should not only act as a guide for Air Force action, but as a warning to supplier nations who could read the text and understand the consequences of their actions prior to implementation of resource reduction.

Also critical to our ability to acquire new weapon systems is the reliance on subcontractors. Between 50 and 60 percent of all new weapons systems are made up of parts produced by subcontractors. For example, the F-15 is produced from

components manufactured by over 300 different contractors and all parts must be available from the myriad of contractors to complete the manufacturing of each aircraft. This greatly diversified base becomes very significant when the industry is requested to surge during periods of hostility and contributes to a lack of responsiveness. Furthermore, it is estimated that to add one additional F-15 to the current production schedule would take 39 months because of the nonavailability of component parts.⁷⁴ This inability of the aerospace industry to expand could become critical during times of war when the industrial base must mobilize to support the warfighting effort.

Although the PPBS and acquisition processes are explained in detail in AFM 1-10, they do not actually concern the requirements of combat nor adequately prepare the combat support commander to fight a war, prepare for war, or employ his forces.⁷⁵ The far-reaching result of combat support doctrine should be to prepare the commander for the employment of resources in war and none of the combat support principles adequately address this fact other than in a peripheral sense. Overall, combat support has been treated like a life cycle analysis, an acquisition process, promotions and assignments, raw materials and maintainability initiatives, not as a direct and immediate effect of forces employed in combat.⁷⁶ AFM 1-10 should take a much simpler look at the doctrinal issue and discuss all support functions at a level to provide guidance to

build policy that supports doctrinal ideals and provide the combat support commander the foundation necessary to employ forces in war.

Overall, AFM 1-10 provides the basic doctrinal support for combat support functions, but there must be a link to connect the established doctrine with plans, policies, and programs required to sustain combat capability. The development of this linkage has been under consideration for several years now and will result in the publication of the Air Force Logistics Concept of Operation.⁷⁹

The process to develop a concept of operations for the logistics community began in 1987 when General Marquez formed a tiger team of the most experienced and senior logisticians in the Air Force. They formulated four principles to support doctrinal concepts concerning the wartime environment that are to become the foundation of the logistics concept of operations. First, the Air Force must overcome high levels of attrition in both weapons systems and support infrastructure. Second, there will be high levels of unpredictable consumption of items at all levels and the industrial base will not be able to make any meaningful contribution for a long period of time. Third, the fog of war will cause tremendous uncertainty that will have to be compensated for by support forces. Finally, augmentation will be required to compensate for attrition.⁸⁰ The framework provided by these principles will help ensure that the logistics system responds directly to operational

requirements, recognizes the uncertainties of war, provides for maximum self-sufficiency at the unit level, and the ability to operate in a resource constrained environment. The Air Force Logistics Concept of Operations will provide the vital link between doctrine and planning, focusing on the development of strategic planning objectives that will provide for a viable policy that supports the control capability of the theater CINCs.^{*1}

An important part of combat support is performed by civil engineers. Although AFM 1-1 and AFM 1-10 provide an umbrella for combat support doctrine, current doctrine has neglected elements such as the recognition of change, impact of military technology, and the vulnerability of base infrastructure that may be a limiting factor in combat effectiveness in future warfare.^{*2} Responsibility for the base infrastructure is with the civil engineers.

Civil engineers have been intimately involved in every conflict since World War I. They were responsible for the buildup of forward bases in both world wars and scratched together air fields in Korea in a war that no one was prepared for. Civil engineers again met the massive demands for facilities and infrastructure during the Vietnam conflict and today, meet civic action, contingency support, and disaster relief missions around the world in addition to their day-to-day mission of maintaining Air Force facilities.^{*3} Although armed with a long and successful history, very few

engineers have recorded their fundamental lessons and warfighting principles gained from decades of experience and this has led to a void in the development of civil engineering doctrine.⁶⁴

In an effort to fill the doctrinal void, several studies have been conducted that recognize the requirement for a strong civil engineering doctrine. The *Theater Air Base Vulnerability (TAB VEE) Study* determined the need for defending air bases in Europe and resulted in an increase in spending for both the United States and allies of substantial sums for passive air base defense, including measures such as aircraft shelter facilities hardening, alternate runways, and tone-down.⁶⁵ The study eventually evolved into the Air Force Air Base Survivability Program. In 1979, the *Joint Contingency Construction Requirements Study* highlighted the struggle of Air Force engineers to formalize their roles and missions. Finally, the *Air Force 2000* study has emphasized mobility, flexibility, and survivability to provide a basis for civil engineering doctrine.

Since air bases are fixed targets they are very vulnerable to attack by an ever increasing array of lethal weapons systems (nuclear, chemical, biological, and conventional) that are becoming more accurate, faster, and more effective over longer ranges.⁶⁶ Soviet doctrine emphasizes air base attack and forces are structured to destroy air bases before aircraft can be launched to counter the offensive. Doctrine must provide

the engineer with the where-with-all to prepare for war while maintaining the base infrastructure. Major General George E. Ellis, DCS/Engineering and Services, has required the civil engineers to prepare for war as their number one priority ensuring that "the air base must do much more than survive--it must perform under fire."⁷

Decisions based on the historical perspective of Air Force leaders and an emphasis on performance during the development stages of a new aircraft have resulted in today's high performance aircraft being the best in the world but requiring a very vulnerable and extensive support system of long hard runways with large sophisticated maintenance facilities. AFM 1-1 acknowledges the concepts of aerospace vulnerability, but it does not address the operational environment in terms of increased danger or lethality and excludes discussion of the terrestrial environment where aerospace systems are based. Without a strong, encompassing doctrine delineating the vulnerabilities of current basing requirements and the effects of technology on air base survivability, viable strategies cannot be developed to protect the facilities nor can adequate plans and programs be written. Instead of relating aerospace power in terms of a warfare system consisting of the integrated application of weapon systems and basing systems, we plan and program as if they were independent entities."⁸

Summary

The fact that doctrine consists of time-tested principles

that may be altered as changes in the environment, technology, or threat occur while at the same time maintain unalterable truths concerning the use of air power provides strength to Air Force doctrine. Along with this strength, any change in doctrine will be accompanied by some level of controversy. The areas of combat support, close air support, and space are excellent examples of current controversial areas.

First, combat support which is defined as that part of the aerospace system that creates and sustains combat forces during wartime and peace was essentially without a doctrine until the 1980s because AFM 1-1 concentrated on the operational aspects of doctrine. After an aggressive study and the integration of support functions with logistics functions under the umbrella of "combat support," AFM 1-10, *Combat Support Doctrine* was written to fill the gap. However, with the defined doctrine, debates were initiated as to the proper direction the doctrine should follow. AFM 1-10 may not provide adequate support to the real warfighting requirements, but perpetuate an old cumbersome system that may be unable to meet the requirements in time of war. Although there is no definitive answer as yet, discussions are underway to address these concerns. As part of the link between doctrine and the operational requirements, the Logistic Concept of Operations has been produced to ensure that combat support is made part of all plans and programs. The Air Force Civil Engineers are well aware of the need for doctrine to provide guidance for their portion of combat support. Their

efforts along this line and dedication to the warfighting spirit are steps towards a more comprehensive, useful doctrine.

Second, the very doctrinal basis for CAS is under fire today with concerns of the true place for the CAS mission--Air Force or Army. Two issues are central to this discussion, should the Army assume the role of supporting troops in contact with the enemy and should the USAF fixed-wing aircraft continue to provide CAS considering the lethality of air defenses on the modern battlefield. An outgrowth of these issues are concerns about the selection for the next generation of CAS aircraft as either a dedicated CAS asset or multi-roled fighter. At the very heart of all controversy is the Army's concern that the Air Force will not be there when needed. However, Air Force doctrine of centralized control and decentralized execution to support the ground commander with fast fixed-wing aircraft capable of massing firepower and surviving a high-threat environment should meet Army requirements.

Finally, space provides unique doctrinal problems. Although the United States has been in space since the late 1950s, the development of space has lacked direction, insight into the true potential of a completely new medium of operation, and doctrinal development constrained by those who have more experience in the terrestrial environment than the boundlessness of space. Although the development of AFM 1-6, *Space Doctrine* and organization of the US Space Command are steps in the right direction, it is the very national policy

that the support that confines space doctrine to policy instead of allowing the freedom to explore the full scope of possibilities and potential space. Space should be viewed as a completely new medium with a pure doctrine that then provides basis for national policy rather than the other way around. Solutions to controversy over proper direction of space doctrine will be a long way off, but necessary to the development of a proper doctrine as capabilities and knowledge of space expand.

Many areas of concern suggest that Air Force doctrine is not perfect, but it is also not stoic or dogmatic. It is the strength to recognize the need for doctrinal refinement by those fighting or supporting the war while maintaining a strong basic doctrinal foundation that makes Air Force doctrine able to continue to provide the proper guidance for the Air Force today. Without a viable doctrine articulating considerations of the basing infrastructure, the effectiveness of Air Force strategy for acquisition and employment of warfare systems cannot be optimum.* One example of current shortfalls is the large sums of money spent on procurement of tactical aircraft and the relatively small amounts dedicated to wartime repair capabilities.** Air Force civil engineers must recognize the consequences of a vulnerable basing system and develop a coherent doctrine driven by technological advancement. This doctrine should be based on the principles of war that reflect axioms and universally-accepted truths concerning the best way

to employ engineer forces, develop missions and tasks that are fully integrated into the Air Force mission throughout the spectrum of war, and provide a vehicle for furthering an engineering professional code of ethics.''

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